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APPENDICES TO THE USER'S MANUAL

FOR

A COMPUTER PROGRAM FOR THE EMULATION/SIMULATION OF A SPACE STATION ENVIRONMENTAL CONTROL AND LIFE SUPPORT SYSTEM

BY

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ABSTRACT

A User's Manual for the Emulation Simulation Computer Model was published previously. The model consisted of a detailed model (emulation) of a SAWD CO_2 removal subsystem which operated with much less detailed (simulation) models of a cabin, crew, and condensing and sensible heat exchangers. The purpose was to explore the utility of such an emulation/simulation combination in the design, development, and test of a piece of ARS hardware - SAWD.

Extensions to this original effort are presented in this manual. The first extension is an update of the model to reflect change in the SAWD control logic which resulted from test. In addition, slight changes were also made to the SAWD model to permit restarting and to improve the iteration technique. The second extension is the development of simulation models for more pieces of air and water processing equipment. Models are presented for: ECD, Molecular Sieve, Bosch, Sabatier, a new condensing heat exchanger, SPE, SFWES, Catalytic Oxidizer, and multifiltration. The third extension is to create two systems simulations using these models. The first system presented consists of one air and one water processing system. The second system consists of a potential Space Station air revitalization system complete with a habitat, laboratory, four nodes, and two crews.

FOREWORD

This User's Manual has been prepared by Hamilton Standard Division of United Technologies Corporation for the National Aeronautics and Space Administration's Langely Research Center in accordance with Contract NAS 1-17397, "Development of an Emulation/Simulation Computer Model of a Space Station Environmental Control and Life Support System (ECLSS)". This manual describes the use of the three models developed under this contract.

Appreciation is expressed to the Technical Monitors Messrs. John B. Hall, Jr. and Lawrence F. Rowell of the NASA Langley Research Center for their guidance and advice.

This manual was written by Dr. James L. Yanosy, Program Engineer, with assistance from Mr. Stephen A. Giangrande. The extensions to the program presented in this manual were performed under the direction of Mr. John M. Neel, Program Manager. Thanks is given to Joseph M. Homa for his efforts in the development of the Space Station Model.

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1.0 INTRODUCTION

The Original User's manual [4]* presented the instructions to use the Emulation Simulation Computer Model (ESCM). This model consisted of simple models of a crew, sensible heat exchanger, condensing heat exchanger, and a cabin combined with a very detailed model of the SAWD CO_2 Removal Subsystem. The simple models are called simulations while the very detailed model is called an emulation. The purpose of the program was to explore the utility of a combined emulation/simulation program to assist in the design, development, and testing of a piece of hardware-SAWD.

This original effort was extended to update the ESCM model following SAWD testing, to develop new computer simulations of other air revitalization and wastewater processing equipment, and lastly to develop two system simulations which would incorporate various air revitalization and wastewater processing equipment. The purpose of these additional system simulations is to explore their utility in system design.

This report presents in the form of appendices to the original User's Manual the new instructions for ESCM, the instructions to use ECLSB, and the instructions to use the Space Station Model.

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*Numbers in brackets denote references listed in Section 2.0.

ESCM was updated to incorporate the new control logic resulting from tests. In addition several improvements were also made in the output and the iteration procedure. ECLSB is one of the system simulations generated. It models one ARS combines with a water processing system. The User's Manual for this system has already been published [1], but it is included as Appendix B for completeness. Lastly, a Space station model was generated; it consists of a habitat, laboratory, four nodes, and two crews. Only air revitalization processes are simulated; the instructions for this model are presented in Appendix C.

The following are errata in the original User's Manual:

(1) Page 2, Figure 1: above the box titled Launch Operation the words should be "Design changes" instead of Design chanes.

(2) Page 17, Table 5: Delete VLH2O subroutine and its description as ESCM never calls it. Also, change "Subroutine None" to "Subroutine Name".

(3) Page 18, Table 6: Delete DUCT subroutine and its description as ESCM never call it. Also, change "Subroutine None" to "Subroutine Name".

(4) Page 47, Table 8, NSTR15 Card; add the following in the comment field: "Pressure from secondary side".

(5) Page 48, Table 8, NSTRE20 Card; add the following in the comment field; "Pressure from secondary side".

(6) Page 49, Table 8, NSTR32 Card; add the following in the comment field: "Tank fluid temperature is specified".

(7) Page 50, Table 8; the second TITL 21 3 line should be renumbered to TITL 21 4.

(8) Page 50, Table 8: the line after TITL 23 3 should be renumbered from TITL 21 3 to TITL 23 4.

(9) Page 51, Table 8: the lines beginning with VALU 71 14 and VALU 71 15 should have the numbers 0.315 and 1.000 deleted.

(10) Page 53, Figure 8: in Note at top of figure, change the word "nonzero" to "non-blank". The program checks for a blank field; if the field is not blank, then the program takes the specified action.

(11) Page 65, Section 4.3: add the following for the missing item (7) in the list of eleven values printed to the screen: "7) SAWD bed #1 H_2O loading, % of dry amine wgt.

(12) Page 67, first six lines, references to Appendix B should be changed to Appendix C.

(13) Page 67, item (3) at top of page should read: "3) Schematic printouts at the requested printoff frequency. See Figure 6 and Appendix C.

(14) Page 67, item (2) in the middle of the page: change "indenpendent" to "independent".

(15) Page 68, definition of NUMCAS: change sentence in parentheses to read: "(Refer to Appendix B GPLOT.DATA)".

(16) Page A-10, Section A.4: change ESCMZE to ESCM2E.

2.0 REFERENCES

(1) Yanosy, J., "User's Manual for a Computer Program for the Simulation of a Space Station Environmental Control and Life Support System (ECLSB)", Hamilton Standard Report SVHSER 10630 for the National Aeronautics and Space Administration, Langley Research Center; September 1986.

(2) "G189A Generalized Environmental/Thermal Control and Life Support System Computer Program Manual", McDonnell Douglas Corporation MDA C-G2444; September 1971.

(3) "CAETMS User's Manual", Volume 1, Version 2.0, by United Technologies Hamilton Standard Engineering Software Systems; September 1986.

(4) Yanosy, J., "User's Manual for a Computer Program for the Emulation/Simulation of a Space Station Environmental Control and Life Support System (ESCM)", Hamilton Standard Report SVHSER 9503 for the National Aeronautics and Space Administration, Langley Research Center; NASA CR-181735, September 1988.

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APPENDIX A

ESCM UPDATE

A.1 INTRODUCTION

The computer program for the emulation/simulation of a Space Station environmental control and life support system (ESCM) has been updated. Updates to the computer simulation model include: (1) the addition of an energy balance control logic (flow sensor control) for the SAWD CO_2 removal subsystem, the capability of restarting the SAWD subsystem, clamping the SAWD bed segment temperature when iterating on the bed temperature during the energy balance of the bed segment, and the addition of a new output table to the hardcopy and screen output.

A new type of control has been incorporated in the SAWD subsystem. This control method is an energy balance method. Using this method, the amount of water remaining on the bed after absorption can be calculated from an energy balance of the bed. Based on the water remaining on the absorbed bed, the next absorb time is calculated. Thus, the absorption time is regulated to control the amount of water on the bed at the end of absorption. The time to desorb the bed is dependent on the water flow as well as steam generator power.

The capability of restarting the SAWD subsystem has been added to the SAWD subroutine. Previously, the user was required to run the program for steady state before the transient could be run. With the restart capability, the simulation can be executed from a transient start.

A.2 Description of Program

In order to incorporate the above changes to the ESCM model, two subroutines were modified. These subroutines, GPOLY1 and IR45, required logic changes. All input and output additions to these subroutines will be discussed in this section.

A.2.1 GPOLY1 Subroutine

GPOLY1 was restructured to the following format:

```
IF (N .EQ. 3) Then
      :
END IF
```

The following are input additions to be input once at the first execution of GPOLY1.

KK(6,18) = Bed to be desorbed first at start of transient solution

KK(6,19) = Type of SAWD control 0 = RH control
1 = Accum control
2 = Flow sensor control

The following are input and output additions to be input and output from GPOLY1 before the solution of component #14 (splitter for gas flow from main cabin to SAWD Bed #1 or SAWD Bed #2).

INPUT:

VV(29,68)	=	steam generator power, watts
VV(27,100)	=	H_2O supply tank flow, pph
KK(32,16)	=	Type of CO_2 delivery 0 = overboard 1 = CO_2 reduction
VV(32,70)	=	CO_2 accumulator temperature, F

OUTPUT:

CO2REM	=	CO_2 removed from air, lbm
CO2LOD	=	CO_2 removed from air per # of bed, %
TCYCLE	=	Total cycle time, sec
H2OADD	=	H_2O added to air, lbm
H2OLOD	=	H_2O added air per # of bed, %
TBLD	=	Time for bleed down, sec
WAIR	=	Total air through bed, lbm
WLOD	=	Total air through bed per # bed, %
TA EX	=	Time for air exchange, sec
BH201	=	Water loading, lbm
WLOAD	=	Water loading per # of bed, lbm
TABDT	=	absorption time, sec
BCO21	=	CO_2 loading on bed, lbm
CLOAD	=	CO_2 loading at end of cycle per # of bed, %
CO2RR	=	CO_2 removal rate, pph

OUTPUT:

TABMAX	=	Next absorb time limit, sec
EFF	=	CO_2 removal efficiency, %
WCO21B	=	CO_2 at end of bleed, lbm
WCO21E	=	CO_2 at end of air exchange, lbm
TDES	=	desorb time, sec
CO2OBD	=	CO_2 to accumulator package, lbm
PCTCO2	=	CO_2 to accumulator package per # of bed, %
TFLAG	=	Lag time after desorption, sec
AVGDLV	=	average rate of CO_2 delivered to accumulator package, pph
WSTEAM	=	amount of steam through the bed, lbm
WSLOD	=	amount of steam through bed per # of bed, %
WSTM	=	steam flow during next desorption cycle, pph
BH2O2	=	Water loading on bed, lbm
WCO22B	=	CO_2 loading at end of bleed, lbm
BCO22	=	CO_2 loading on bed, lbm
WCO22E	=	CO_2 loading at end of air exchange, lbm
ACH2O	=	H_2O vapor flow to accumulator and flow sensor
ACO2	=	O_2 flow to accumulator and flow sensor
ACN2	=	N_2 flow to accumulator and flow sensor
ACCO2	=	CO_2 flow to accumulator and flow sensor
TOTWGT	=	Total vapor flow to accumulator and flow sensor
PURITY	=	CO_2 purity to accumulator and flow sensor

A.2.2 IR45 Subroutine

Additional logic was incorporated into the IR45 subroutine to allow the SAWD subsystem restart capability. The SAWD can be started from a transient startup without the steady state solution being performed first. The restart capability was incorporated in the IR45 subroutine be initializing the SAWD inlet and exit header values as well as each bed segment (i.e., temperature, pressure, molecular weight ...) in the IR45 subroutine. Previously, these values were initialized in the subroutine STAEDY which is only performed during a steady state solution.

Additional logic was also added to IR45 in subroutine BALNCE. This logic clamps the bed segment temperature which has just been calculated through the iteration technique. If the bed segment inlet temperature is greater than the bed segment temperature at the start of the time step, then the bed segment temperature must increase.

A.3 Program Use

A.3.1 Accessing Desired Job Control List

Instructions to access ESCM and use the program have not been changed. However, the command list to be accessed is ESCMECL.CLIST instead of ESCMCL.CLIST. A listing of the ESCMECL.CLIST is given in Table A-1.

TABLE A-1

LISTING OF ESCMECL FOR ESCM MODEL

```
CONTROL PROMPT NOMSG
ERASE
N1: DELETE PLOT.DATA
    DELETE OUT.DATA
FREE FILE(FT05F001)
FREE FILE(FT06F001)
FREE FILE(FT10F001)
FREE FILE(FT11F001)
FREE FILE(FT16F001)
FREE FILE(FT20F001)
FREE FILE(FT80F001)
FREE FILE(FT81F001)
FREE FILE(FT41F001)
FREE FILE(FT42F001)
FREE FILE(FT43F001)
FREE FILE(FT44F001)
FREE ATTRLIST(A1 B2 C3 D4 E5)
ATTRIB A1 BLKSIZE(844)  RECFM(V B)   LRECL(844)
ATTRIB B2 BLKSIZE(10000) RECFM(V B S) LRECL(10000)
ATTRIB C3 BLKSIZE(8404) RECFM(V B S) LRECL(8404)
ATTRIB D4 BLKSIZE(8990) RECFM(F B A) LRECL(133)
ATTRIB E5 BLKSIZE(8990) RECFM(F B) LRECL(80)
DELETE DD1
DELETE DD2
DELETE DD3
DELETE DD4
DELETE DD5
DELETE DD6
DELETE IN10
DELETE IN11
WRITE
WRITE
WRITE  DATA SETS ARE NOW BEING ALLOCATED.
ALLOC DS(DD1) F(FT41F001) NEW SPACE(844,200)  BLOCK(844) +
        USING(A1)   DELETE
ALLOC DS(DD2) F(FT42F001) NEW SPACE(200,200) BLOCK(10000) +
        USING(B2)   DELETE
ALLOC DS(DD3) F(FT43F001) NEW SPACE(200,200) BLOCK(8404) +
        USING(C3)   DELETE
ALLOC DS(DD4) F(FT44F001) NEW SPACE(200,200) BLOCK(8403) +
          USING(C3)   DELETE
ALLOC DS(DD5) F(FT80F001) NEW SPACE(200,200) BLOCK(8403) +
          USING(C3)   DELETE
ALLOC DS(DD6) F(FT81F001) NEW SPACE(200,200) BLOCK(8403) +
          USING(C3)   DELETE
ALLOC DS(IN10) F(FT10F001) NEW SPACE(200,200) BLOCK(8403) +
        USING(C3)   DELETE
ALLOC DS(IN11) F(FT11F001) NEW SPACE(200,200) BLOCK(8403) +
        USING(C3)   DELETE
ALLOC DS(ESCM2E.DATA) F(FT05F001)
```

TABLE A-1 (Continued)

LISTING OF ESCMECL FOR ESCM MODEL

```
ALLOC DS(OUT.DATA) F(FT06F001) NEW SPACE(200,200) BLOCK(8120) +
        USING(D4)   CATALOG
ALLOC DS(PLOT.DATA) F(FT16F001) NEW SPACE(200,200) BLOCK(8408) +
      UNIT(TSOWRKB) USING(C8)   CATALOG
ALLOC DS(*)   F(FT20F001)
CONTROL MSG
WRITE
WRITE  DATA SETS HAVE BEEN ALLOCATED.  PROGRAM IS NOW EXECUTING.
TIME
CALL 'ENG.G15.LM(ESCM2)'
WRITE
WRITE  THE PROGRAM HAS FINISHED.
TIME
END
```

A.3.2 Input Data

There is an addition to the existing input data set, ESCM2B. An extra KARY card, KARY 19, was added to component #6 (cooling fluid boundary conditions). KARY 19 represents the type of control to be used for the SAWD subsystem. If KARY 19 is 0, relative humidity control is used for the SAWD. Accumulator control will be used if KARY 19 is 1. If KARY 19 is 2, then the newly implemented flow sensor (energy balance) control is used. This new data set is called ESCM2E. The procedure for accessing the data set is the same as in the original User's Manual [4].

A.3.3 ESCM Output

Additional output is available to two of the three forms of the output (screen and hardcopy output). At the end of each absorption and desorption, a summary of SAWD calculated parameters is output in tabular form. This table will appear on the screen and on hardcopy immediately following the schematic corresponding to the completion of the absorption or desorption. The values printed on the table include:

(1) CO_2 removed from air during absorption, lbm

(2) CO_2 removed from air during absorption per # of bed, lbm

(3) Total cycle time, sec

(4) H_2O added to air during absorption, lbm

(5) H_2O added to air (absorption) per # of bed, %

(6) Time for bleed down (absorption), sec

(7) Total air through bed (absorption), lbm

(8) Total air through bed (absorption) per # of bed, %

(9) Time for air exchange (absorption), sec

(10) Water loading at end of absorption, lbm

(11) Water loading at end of absorption per # of bed, %

(12) Absorption time, sec

(13) CO_2 loading at end of absorption, lbm

(14) CO_2 loading at end of absorption per # of bed, %

(15) CO_2 removal rate, pph

(16) Next absorb time limit, sec

(17) CO_2 removal efficiency %

(18) CO_2 on bed at end of bleed (absorbing bed), lbm

(19) CO_2 on bed at end of air exchange (absorbing bed), lbm

(20) CO_2 removed from bed (desorption), lbm

(21) CO_2 removed from bed per # bed (desorbing bed), %

(22) Desorption time, sec

(23) CO_2 to accumulator package, lbm

(24) CO_2 to accumulator package per # of bed, %

(25) Lag time after desorption sec

(26) Water added to bed (desorbing bed), lbm

(27) Water added to bed (desorbing) per # of bed %

(28) Average rate of CO_2 delivered to accumulator package, pph

(29) Amount of steam through the bed, lbm

(30) Steam flow during next desorption cycle, pph

(31) Water loading at the end of desorption, lbm

(32) Water loading at end of desorption per # of bed, %

(33) CO_2 loading at end of bleed (desorption), lbm

(34) CO_2 loading on bed at end of desorption, lbm

(35) CO_2 loading on bed at end of desorption per # of bed, %

(36) CO_2 on desorbing bed at end of air exchange, lbm

(37) Water vapor flow to accumulator flow sensor

(38) O_2 vapor flow to accumulator and flow sensor

(39) N_2 vapor flow to accumulator and flow sensor

(40) CO_2 vapor flow to accumulator and flow sensor

(41) Total vapor flow to accumulator and flow sensor

(42) Carbon dioxide purity of flow to accumulator and flow sensors

A.4 Sample Problem

A sample problem has been run using the updated ESCM computer simulation/emulation model and the ESCMZE to input data set. The case was run for four hours. The hardcopy output of this sample problem is shown in Table A-3.

TABLE A-2

SAWD PERFORMANCE SUMMARY OUTPUT

```
COMPUTER SIMULATION RESULTS FOR SAWD II CYCLE NUMBER   1 TIME =  2310.0 SEC

********* ABSORPTION SUMMARY **************
*********      FOR BED #1     **************
                            TOTAL  PER # OF
                            (LBM)   BED, %
CO2 REMOVED FROM AIR   =  0.000     0.00   TOTAL CYCLE TIME         = 2310.0 SEC
H2O ADDED TO AIR       =  0.000     0.00   TIME FOR BLEED DOWN      =    0.0 SEC
TOTAL AIR THROUGH BED  =   0.00      0.0   TIME FOR AIR EXCHANGE    =    0.0 SEC
WATER LOADING AT END   =  2.550   30.000   ABSORPTION TIME          = 2310.0 SEC
CO2 LOADING AT END     =  0.005    0.059   CO2 REMOVAL RATE         =  0.000 PPH
NEXT ABSORB TIME LIMIT = 3300.0 SEC        CO2 REMOVAL EFFICIENCY   =   0.00 PCT
CO2 AT END OF BLEED    =  0.005 LBM        CO2 AT AIR EXCHG END     =  0.005 LBM
********* DESORPTION SUMMARY **************
*********      FOR BED #2     **************
                            TOTAL  PER # OF
                            (LBM)   BED, %
CO2 REMOVED FROM BED   =  0.294     3.46   DESORPTION TIME          = 2310.0 SEC
CO2 TO ACCUM. PKG.     =  0.175     5.00   LAG TIME AFTER DESORB    =    0.0 SEC
H2O ADDED TO BED       =  1.620    19.06   AVG CO2 TO ACCUM. PKG.   =  0.273 PPH
STEAM THROUGH BED      =  1.636    19.25   NEXT DESORB STEAM FLOW   =  2.550 PPH
WATER LOADING AT END   =  3.700   43.530   CO2 AT END OF BLEED      =  0.300 LBM
CO2 LOADING AT END     =  0.006    0.073   CO2 AT AIR EXCHG END     =  0.300 LBM

SUMMARY OF FLOW TO FLOW SENSOR AND ACCUMULATOR
WATER VAPOR    =  0.038 LBM
OXYGEN         =  0.000 LBM
NITROGEN       =  0.000 LBM
CARBON DIOXIDE =  0.306 LBM
TOTAL          =  0.343 LBM

PURITY         =  89.08 PCT
```

TABLE A-2 (CONTINUED)

SAWD PERFORMANCE SUMMARY OUTPUT

```
COMPUTER SIMULATION RESULTS FOR SAWD II CYCLE NUMBER   2 TIME =  5790.0 SEC

********* ABSORPTION SUMMARY **************
*********       FOR BED #2     **************
                        TOTAL   PER # OF
                        (LBM)    BED, %
CO2 REMOVED FROM AIR   =  0.220     2.59   TOTAL CYCLE TIME        = 3480.0 SEC
H2O ADDED TO AIR       =  2.007    23.62   TIME FOR BLEED DOWN     =   60.0 SEC
TOTAL AIR THROUGH BED  =  61.28    721.0   TIME FOR AIR EXCHANGE   =  120.0 SEC
WATER LOADING AT END   =  1.693   19.914   ABSORPTION TIME         = 3300.0 SEC
CO2 LOADING AT END     =  0.227    2.666   CO2 REMOVAL RATE        =  0.240 PPH
NEXT ABSORB TIME LIMIT = 1200.0 SEC        CO2 REMOVAL EFFICIENCY  =   0.00 PCT
CO2 AT END OF BLEED    =  0.006 LBM        CO2 AT AIR EXCHG END    =  0.008 LBM
********* DESORPTION SUMMARY **************
*********       FOR BED #1     **************
                        TOTAL   PER # OF
                        (LBM)    BED, %
CO2 REMOVED FROM BED   = -0.012    -0.14   DESORPTION TIME         = 3300.0 SEC
CO2 TO ACCUM. PKG.     =  0.050     5.00   LAG TIME AFTER DESORB   = 2820.0 SEC
H2O ADDED TO BED       =  1.032    12.15   AVG CO2 TO ACCUM. PKG.  =  0.052 PPH
STEAM THROUGH BED      =  0.329     3.87   NEXT DESORB STEAM FLOW  =  2.550 PPH
WATER LOADING AT END   =  3.582   42.145   CO2 AT END OF BLEED     =  0.030 LBM
CO2 LOADING AT END     =  0.017    0.200   CO2 AT AIR EXCHG END    =  0.034 LBM


SUMMARY OF FLOW TO FLOW SENSOR AND ACCUMULATOR
WATER VAPOR     =  0.034 LBM
OXYGEN          =  0.016 LBM
NITROGEN        =  0.057 LBM
CARBON DIOXIDE  =  0.009 LBM
TOTAL           =  0.116 LBM

PURITY          =   7.46 PCT


COMP NO   12  FAN       SUBR NO  23     PRI SOR     11     SEC SOR      0          COMP PASS NO   387       TIME =  5805.0 SEC
                        FAILURE FLAGS -- COMP=  1     LOOP=  0        ELAPSED TIME IN MILLISEC -- CP= 3932     PP=      0
VR(  1)=  1392.7      VR(  2)=  49.944      VR(  3)=  14.689      VR(  4)=  14.689      VR(  5)=  1382.7      VR(  6)=  9.9928
VR(  7)= 0.00000E+00 VR(  8)= 0.24310      VR(  9)=  28.864      VR( 10)=  305.75      VR( 11)=  1069.5      VR( 12)=  7.4079
VR( 13)= 0.00000E+00 VR( 14)= 0.00000E+00 VR( 20)= 0.00000E+00 VR( 21)= 0.00000E+00 VR( 22)= 0.00000E+00 VR( 23)= 0.00000E+00
VR( 65)=  477.82      VR( 66)= 0.00000E+00 VR( 67)= 0.00000E+00 VR( 68)= 0.00000E+00 VR( 69)= 0.00000E+00 VR( 70)= 0.00000E+00
VR( 71)= 0.00000E+00 VR( 72)= 0.00000E+00 VR( 73)= 0.00000E+00 VR( 74)= 0.00000E+00 VR( 75)= 0.00000E+00 VR( 76)=  300.00
VR( 77)= 0.00000E+00 VR( 78)= 0.00000E+00 VR( 79)= 0.00000E+00 VR( 80)= 0.00000E+00 VR( 81)= 0.00000E+00 VR( 82)= 0.00000E+00
VR( 83)= 0.00000E+00 VR( 84)=  1.0000      VR( 85)= 0.00000E+00 VR( 86)= 0.00000E+00 VR( 87)= 0.00000E+00 VR( 88)= 0.00000E+00
VR( 89)= 0.00000E+00 VR( 90)= 0.00000E+00 VR( 91)=  140.00      VR( 92)= 0.00000E+00 VR( 93)= 0.00000E+00 VR(
                         CPP= 0.24455        WTMP=  28.740       RHOP= 0.77159E-01   VISCP= 0.44000         XKP= 0.14600
                         CPS= 0.00000E+00    WTMS= 0.00000E+00   RHOS= 0.00000E+00   VISCS= 0.00000E+00     XKS= 0.00000E+00
```

TABLE A-2 (CONTINUED)

SAWD PERFORMANCE SUMMARY OUTPUT

ORIGINAL PAGE IS
OF POOR QUALITY

```
COMPUTER SIMULATION RESULTS FOR SAWD II CYCLE NUMBER   3 TIME =  7050.0 SEC

********* ABSORPTION SUMMARY ***************
*********       FOR BED #1      **************
                             TOTAL  PER # OF
                             (LBM)   BED, %
CO2 REMOVED FROM AIR    =  0.082     0.96   TOTAL CYCLE TIME        = 1260.0 SEC
H2O ADDED TO AIR        =  1.246    14.66   TIME FOR BLEED DOWN     =   60.0 SEC
TOTAL AIR THROUGH BED   =  22.30    262.4   TIME FOR AIR EXCHANGE   =    0.0 SEC
WATER LOADING AT END    =  2.336   27.482   ABSORPTION TIME         = 1200.0 SEC
CO2 LOADING AT END      =  0.099    1.162   CO2 REMOVAL RATE        =  0.245 PPH
NEXT ABSORB TIME LIMIT = 1200.0 SEC         CO2 REMOVAL EFFICIENCY =   0.00 PCT
CO2 AT END OF BLEED     =  0.011 LBM        CO2 AT AIR EXCHG END    =  0.011 LBM
********* DESORPTION SUMMARY ***************
*********       FOR BED #2      **************
                             TOTAL  PER # OF
                             (LBM)   BED, %
CO2 REMOVED FROM BED    =  0.216     2.54   DESORPTION TIME         = 1200.0 SEC
CO2 TO ACCUM. PKG.      =  0.093     5.00   LAG TIME AFTER DESORB   =  585.0 SEC
H2O ADDED TO BED        =  1.201    14.13   AVG CO2 TO ACCUM. PKG. =  0.265 PPH
STEAM THROUGH BED       =  0.425     5.00   NEXT DESORB STEAM FLOW =  0.156 PPH
WATER LOADING AT END    =  2.894   34.048   CO2 AT END OF BLEED     =  0.087 LBM
CO2 LOADING AT END      =  0.011    0.124   CO2 AT AIR EXCHG END    =  0.087 LBM


SUMMARY OF FLOW TO FLOW SENSOR AND ACCUMULATOR
WATER VAPOR    =  0.098 LBM
OXYGEN         =  0.059 LBM
NITROGEN       =  0.208 LBM
CARBON DIOXIDE =  0.143 LBM
TOTAL          =  0.509 LBM

PURITY         =  28.16 PCT


COMP NO   12  FAN       SUBR NO  23    PRI SOR    11    SEC SOR     0          COMP PASS NO   471      TIME =  7065.0 SEC
                        FAILURE FLAGS -- COMP=  1     LOOP=  0         ELAPSED TIME IN MILLISEC -- CP= 1424     PP=      0
VR(  1)=  1392.4      VR(  2)=  50.062      VR(  3)=  14.687      VR(  4)=  14.687      VR(  5)=  1382.3      VR(  6)=  10.035
VR(  7)= 0.00000E+00 VR(  8)= 0.24308      VR(  9)=  28.868      VR( 10)=  305.62      VR( 11)=  1068.8      VR( 12)=  7.8741
VR( 13)= 0.00000E+00 VR( 14)= 0.00000E+00 VR( 20)= 0.00000E+00 VR( 21)= 0.00000E+00 VR( 22)= 0.00000E+00 VR( 23)= 0.00000E+00
VR( 65)=  477.82      VR( 66)= 0.00000E+00 VR( 67)= 0.00000E+00 VR( 68)= 0.00000E+00 VR( 69)= 0.00000E+00 VR( 70)= 0.00000E+00
VR( 71)= 0.00000E+00 VR( 72)= 0.00000E+00 VR( 73)= 0.00000E+00 VR( 74)= 0.00000E+00 VR( 75)= 0.00000E+00 VR( 76)=  300.00
VR( 77)= 0.00000E+00 VR( 78)= 0.00000E+00 VR( 79)= 0.00000E+00 VR( 80)= 0.00000E+00 VR( 81)= 0.00000E+00 VR( 82)= 0.00000E+00
VR( 83)= 0.00000E+00 VR( 84)=  1.0000      VR( 85)= 0.00000E+00 VR( 86)= 0.00000E+00 VR( 87)= 0.00000E+00 VR( 88)= 0.00000E+00
VR( 89)= 0.00000E+00 VR( 90)= 0.00000E+00 VR( 91)=  140.00      VR( 92)= 0.00000E+00 VR( 93)= 0.00000E+00 VR(
                      CPP= 0.24454        WTMP=  28.743       RHOP= 0.77141E-01  VISCP= 0.44000        XKP= 0.14600
                      CPS= 0.00000E+00    WTMS= 0.00000E+00   RHOS= 0.00000E+00  VISCS= 0.00000E+00    XKS= 0.00000E+00
```

TABLE A-2 (CONTINUED)

SAWD PERFORMANCE SUMMARY OUTPUT

```
COMPUTER SIMULATION RESULTS FOR SAWD II CYCLE NUMBER   4 TIME = 11430.0 SEC

######### ABSORPTION SUMMARY ###############
#########       FOR BED #2    ##############
                              TOTAL  PER # OF
                              (LBM)   BED, %
CO2 REMOVED FROM AIR    =  0.256    3.01    TOTAL CYCLE TIME        = 4380.0 SEC
H2O ADDED TO AIR        =  1.533   18.03    TIME FOR BLEED DOWN     =   60.0 SEC
TOTAL AIR THROUGH BED   =  53.54   629.9    TIME FOR AIR EXCHANGE   =    0.0 SEC
WATER LOADING AT END    =  1.361  16.017    ABSORPTION TIME         = 4320.0 SEC
CO2 LOADING AT END      =  0.267   3.139    CO2 REMOVAL RATE        =  0.214 PPH
NEXT ABSORB TIME LIMIT  = 1200.0 SEC        CO2 REMOVAL EFFICIENCY  =   0.00 PCT
CO2 AT END OF BLEED     =  0.011 LBM        CO2 AT AIR EXCHG END    =  0.011 LBM
######### DESORPTION SUMMARY ###############
#########       FOR BED #1    ##############
                              TOTAL  PER # OF
                              (LBM)   BED, %
CO2 REMOVED FROM BED    = -0.005   -0.06    DESORPTION TIME         = 4320.0 SEC
CO2 TO ACCUM. PKG.      =  0.094    5.00    LAG TIME AFTER DESORB   = ###### SEC
H2O ADDED TO BED        =  0.709    8.34    AVG CO2 TO ACCUM. PKG.  =  0.077 PPH
STEAM THROUGH BED       =  0.187    2.20    NEXT DESORB STEAM FLOW  =  0.829 PPH
WATER LOADING AT END    =  3.045  35.825    CO2 AT END OF BLEED     =  0.128 LBM
CO2 LOADING AT END      =  0.104   1.225    CO2 AT AIR EXCHG END    =  0.128 LBM


SUMMARY OF FLOW TO FLOW SENSOR AND ACCUMULATOR
WATER VAPOR     =  0.026 LBM
OXYGEN          =  0.059 LBM
NITROGEN        =  0.205 LBM
CARBON DIOXIDE  =  0.016 LBM
TOTAL           =  0.306 LBM

PURITY          =    5.18 PCT


COMP NO   12  FAN      SUBR NO  23    PRI SOR    11    SEC SOR    0          COMP PASS NO   763       TIME = 11445.0 SEC
                       FAILURE FLAGS -- COMP=  1    LOOP=  0      ELAPSED TIME IN MILLISEC -- CP= 5429     PP=     0
VR(  1)=  1392.8      VR(  2)=  50.149      VR(  3)=  14.692      VR(  4)=  14.692      VR(  5)=  1382.7      VR(  6)=  10.067
VR(  7)= 0.00000E+00  VR(  8)= 0.24306      VR(  9)=  28.872      VR( 10)=  306.02      VR( 11)=  1068.4      VR( 12)=  8.2637
VR( 13)= 0.00000E+00  VR( 14)= 0.00000E+00  VR( 20)= 0.00000E+00  VR( 21)= 0.00000E+00  VR( 22)= 0.00000E+00  VR( 23)= 0.00000E+00
VR( 65)=  477.82      VR( 66)= 0.00000E+00  VR( 67)= 0.00000E+00  VR( 68)= 0.00000E+00  VR( 69)= 0.00000E+00  VR( 70)= 0.00000E+00
VR( 71)= 0.00000E+00  VR( 72)= 0.00000E+00  VR( 73)= 0.00000E+00  VR( 74)= 0.00000E+00  VR( 75)= 0.00000E+00  VR( 76)=  300.00
VR( 77)= 0.00000E+00  VR( 78)= 0.00000E+00  VR( 79)= 0.00000E+00  VR( 80)= 0.00000E+00  VR( 81)= 0.00000E+00  VR( 82)= 0.00000E+00
VR( 83)= 0.00000E+00  VR( 84)=  1.0000      VR( 85)= 0.00000E+00  VR( 86)= 0.00000E+00  VR( 87)= 0.00000E+00  VR( 88)= 0.00000E+00
VR( 89)= 0.00000E+00  VR( 90)= 0.00000E+00  VR( 91)=  140.00      VR( 92)= 0.00000E+00  VR( 93)= 0.00000E+00  VR(
                      CPP= 0.24452          WTHP=  28.747         RHOP= 0.77165E-01     VISCP= 0.44000        XKP= 0.14600
                      CPS= 0.00000E+00      WTHS= 0.00000E+00     RHOS= 0.00000E+00     VISCS= 0.00000E+00    XKS= 0.00000E+00
```

TABLE A-3

ESCM SAMPLE PROBLEM OUTPUT

```
 SPACE STATION AIR REVITALIZATION SUBSYSTEM SAWD II DEMONSTRATION MODEL.  MISSION TIME:     30. SEC ( 0.01 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                              X
X        CABIN (2)                CREW (1)                 FROM CABIN                          *****       TO CABIN  X
X                                                          M= 9361.                             *             M= 9359.  X
X  VOLUME        =  8000. CU-FT  NO OF MEN   =  3           T= 69.5                             *T= 69.7      T= 64.4  X
X  AIR MASS      = 594.25 LBM    TOTAL Q     = 1350.0 B/HR   A       -------------     -------------           A     X
X  TEMP          =  69.5 F       METABOLIC Q =  450.0 B/HR/MAN A     |SENSIBLE    |     |SENSIBLE    |           A     X
X  DEW PT        =  53.6 F         SENSIBLE  =  326.3 B/HR/MAN A     |HX FAN (4)  | T= 70.7 |HX (5)   |           A     X
X  TOTAL PRESS   = 14.70 PSIA      LATENT    =  123.7 B/HR/MAN AAAAAAAAA|Q  =  2843.|AAAAAAAAA|Q=-14431. |AAAAAAAAAAAAAAA  X
X  O2 PRESS      =  2.88 PSIA    O2 USAGE    = 0.2200 PPH       -----> |CFM=  2100.|         |          |  ------->     X
X  CO2 PRESS     =  2.57 MM-HG   CO2 PROD    = 0.2592 PPH              -------------     -------------                 X
X  GAS LEAKAGE   = 0.083 PPH                                                                  *                        X
X  O2 MAKEUP     = 0.000 PPH                                                          M=1485. *                        X
X  N2 MAKEUP     = 0.000 PPH           FROM                                           T= 60.0 *          TO CABIN     X
X  NON ECLSS Q:                        CABIN                                          *********          M= 1391.     X
X    SENSIBLE    = 17065. B/HR         M= 1392.          ********                      ---->             T= 50.6      X
X    LATENT      =   256. B/HR         T= 69.5           *                                                  A         X
X  ECLSS Q:                              A               *T= 54.4                                           A A       X
X    SENSIBLE    =  6273. B/HR         | A          -------------                               ------------- A |     X
X    LATENT      =   779. B/HR         | A  M= 1392.|REL. HUMD. |                   M= 1391.    |REL. HUMD. | A |     X
X  REL HUMIDITY  = 56.73 PCT           V A  T= 69.5 |HX (7)     | T= 49.2    M= 1349.   T= 49.2   |HX FAN (12)| A |     X
X                                     (31)AAAAAAAAA|Q= -8948.   |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAA|Q  = 478.  |AAA |  X
X                                       A  ----->  |            |  -----> A           A  ----->   |CFM= 300.  |     X
X                                     A A          -------------          | A -------------- A              -------------     X
X                                     | A M=  0.00         *              | A |H2O SEP (10)|  A M= 41.7                       X
X                                     | A T= 59.7          *M= 950.       V AA|Q   =  13.  |AAA T= 50.4                       X
X                                     | A                  *T= 45.0          |CFM =   9.  |                                    X
X FROM CABIN                          | A                ******               --------------                                  X
X M=  0.00                              A                ---->                  M   ---->  H2O INTERFACE: M ADDED =   0.018    X
X T= 69.5                                 ---------------                       MMMMMMMMMMM M=  1.9                             X
X    A                                    |SAWD FAN (19)|             <-------                                                 X
X    A |                                  |Q  =   0.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                     X
X    A |                                  |CFM=   0.    |                         P= 14.70               A A                  X
X    A V                                  ---------------   M=  0.00-------------- M= 69.05              A |                  X
X    A        M=  0.00                                      T= 69.5 |  AMINE    | T= 59.7      M= 69.05  A |                  X
X  (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)AAAAAAAAA| BED 1 (16)|AAAAAAAAA(17)AAAAAAAAA(18)                              X
X    A                   ----->           S    ----> |Q    =    0.|  ---->   C     ---->  A     TO CABIN                      X
X    A  H2O INTERFACE                     S          |MCO2= 0.005|           C           A A    M=  0.00                      X
X    A  M USED =   0.021                  S A        |MH2O= 2.550|           C |         | A    T= 70.0                       X
X    A    M                               S |        -------------           C |         | A      A                           X
X    A  | M                      M=  0.00 S |                       M=  0.00C |          | A    A A                           X
X  | A  | M M=  2.55                      S |                                C |         | A    | A                           X
X  | A  V M T= 70.0                       S |                                C V           A    | A      -------------       X
X  | A ---------      -----------         S                                  C             A    | A      | CO2        |       X
X  | A |PUMP   |  T= 83.4|STEAM    | T=290.1  S      M=  0.00                C       M=  0.00A    A M=  0.00 |ACCUM (32)|      X
X  V A |(28)   |MMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|         X
X    A |Q= 34.|  ----->  |Q= 2905.|  ----->  S    <-----                     C     ---->  A       ----> | M= 0.463 |      X
X    A ---------      -----------         S |                                C A         A A            | P= 29.93 |      X
X    A                           M=  2.55 S |                       M=  0.00C |          A |            -------------     X
X    A                                    S |                                C |         A |               | C             X
X    A                                    S |         -------------- P= 30.00 C |        A |               | C             X
X    A                                    S V M=  2.55|  AMINE    | M=  0.00  C |         A |               V C             X
X    A        M=  0.00                    S   T=290.1 | BED 2 (21)| T= 70.0   C    M=  0.00 A          TO OVBD OR          X
X    AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)SSSSSSSSSS|Q    = 3149.|CCCCCCCCCC(22)AAAAAAAAAAAA     RECOVERY            X
X                        ----->              ----->   |MCO2= 0.304|  ---->        ---->             M=  0.27            X
X                                                     |MH2O= 2.120|                                 T= 70.0             X
X                                                     --------------                                                    X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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TABLE A-3 (CONTINUED)

ESCM SAMPLE PROBLEM OUTPUT

```
SPACE STATION AIR REVITALIZATION SUBSYSTEM SAMD II DEMONSTRATION MODEL.  MISSION TIME:   1800. SEC ( 0.50 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                                  X
X          CABIN (2)                      CREW (1)               FROM CABIN                              *****           TO CABIN  X
X                                                                M= 9354.                                *                M= 9354. X
X  VOLUME        =  8000. CU-FT  NO OF MEN    =  3               T= 69.2                                 *T= 68.8         T= 63.6  X
X  AIR MASS      = 593.84 LBM    TOTAL Q      = 1350.0 B/HR       A         -------------         -------------             A     X
X  TEMP          =   69.2 F      METABOLIC Q =  450.0 B/HR/MAN    A         |SENSIBLE   |         |SENSIBLE   |             A     X
X  DEW PT        =   50.7 F         SENSIBLE  =  327.0 B/HR/MAN    A         |HX FAN (4) | T= 70.5 |HX (5)      |             A     X
X  TOTAL PRESS   = 14.67 PSIA       LATENT    =  123.0 B/HR/MAN   AAAAAAAAA|Q  =  2843.|AAAAAAAAAA|Q=-15773.  |AAAAAAAAAAAAAAA    X
X  O2 PRESS      =   2.88 PSIA   O2 USAGE     = 0.2200 PPH          -----> |CFM=  2100.|          |           |  ------->      X
X  CO2 PRESS     =   2.59 MM-HG  CO2 PROD     = 0.2592 PPH                  -------------          -------------                    X
X  GAS LEAKAGE   = 0.083 PPH                                                                               *                       X
X  O2 MAKEUP     = 0.000 PPH                                                                         M=1799. *                     X
X  N2 MAKEUP     = 0.000 PPH          FROM                                                           T= 60.0 *       TO CABIN     X
X  NON ECLSS Q:                       CABIN                                                          *********       M= 1391.     X
X    SENSIBLE    = 17065. B/HR        M= 1391.             ********                                  ---->           T= 50.1      X
X    LATENT      =   255. B/HR        T= 69.2              *                                                          A           X
X  ECLSS Q:                             A                  *T= 53.3                                                   A A         X
X    SENSIBLE    =  6273. B/HR        | A          -------------                                               -------------  A |  X
X    LATENT      =   779. B/HR        | A   M= 1391. |REL. HUMD. |                            M= 1390.        |REL. HUMD. |  A |  X
X  REL HUMIDITY  = 51.40 PCT          V A   T= 69.2 |HX (7)     | T= 48.7     M= 1348.        T= 48.7        |HX FAN (12)|  A |  X
X                                    (31)AAAAAAAAAA|Q= -7874.  |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAA|Q  = 478.  |AAA |  X
X                                       A   ----->  |           |  -----> A                A    ----->        |CFM= 300.  |       X
X                                     A A          -------------         | A --------------  A                -------------       X
X                                     | A M=  0.00         *              | A |H2O SEP (10)|  A M= 41.7                           X
X                                     | A T= 59.7          *M= 950.       V AA|Q   =  13.  |AAA T= 50.0                           X
X                                     | A                  *T= 45.0           |CFM =   9.  |                                      X
X FROM CABIN                          | A             ******                  --------------                                      X
X M=  0.00                              A             ---->                 M  ---->  H2O INTERFACE: M ADDED =   0.634           X
X T= 69.2                       ---------------                             MMMMMMMMMMM M=  0.8                                   X
X     A                         |SAMD FAN (19)|               <------                                                             X
X     A |                       |Q  =   0.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                             X
X     A |                       |CFM=   0.    |                    P= 14.70                 A A                                   X
X     A V                       ---------------     M=  0.00-------------- M= 69.05          A |                                   X
X     A       M=  0.00                               T= 69.5 |  AMINE    | T= 59.7     M= 69.05  A |                              X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)AAAAAAAAAA| BED 1 (16)|AAAAAAAAAA(17)AAAAAAAAA(18)                              X
X     A                  ----->              S    ---->  |Q   =    0.|  ---->    C   ---->   A    TO CABIN                        X
X     A  H2O INTERFACE                       S           |MCO2= 0.005|           C         A A    M=  0.00                        X
X     A  M USED =   1.275                    S A         |MH2O= 2.550|           C |       | A    T=139.8                         X
X     A    M                                 S |         -------------           C |       | A      A                             X
X     A  | M                        M=  0.00 S |                     M=  0.00C |       | A    A A                             X
X   | A  | M M=  2.55                        S |                                 C |       | A    | A                             X
X   | A  V M T= 70.0                         S |                               . C V       A    | A          ------------         X
X   | A --------         ----------          S                                   C         A    | A          | CO2       |        X
X   | A |PUMP  |  T= 83.4|STEAM   | T=290.0  S      M=  0.00                     C    M=  0.00A      A M=  0.00 |ACCUM (32)|        X
X   V A |(28)  |MMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|           |        X
X     A |Q= 34.|  ---->  |Q= 2905.|  ----->  S    <-----                        C   ---->  A          ---->  | M= 0.442 |        X
X     A --------         ----------          S |                               C A        A A              | P= 29.86 |        X
X     A                             M=  2.55 S |                     M=  0.00C |        A |              ------------         X
X     A                                      S |                                 C |        A |                | C                X
X     A                                      S |          ------------- P= 29.93 C |        A |                | C                X
X     A                                      S V M=  2.55|  AMINE    | M=  0.00  C |        A |                V C                X
X     A       M=  0.00                       S   T=290.0 | BED 2 (21)| T=139.8   C   M=  0.00 A              TO OVBD OR           X
X     AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)SSSSSSSSSS|Q    = 2579.|CCCCCCCCCC(22)AAAAAAAAAAA              RECOVERY             X
X                        ----->                    ---->  |MCO2= 0.111|  ---->      ---->                   M=  0.27             X
X                                                         |MH2O= 3.364|                                     T= 70.0             X
X                                                         -------------                                                         X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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TABLE A-3 (CONTINUED)

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SPACE STATION AIR REVITALIZATION SUBSYSTEM SAND II DEMONSTRATION MODEL.  MISSION TIME:   3600. SEC ( 1.00 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X
X          CABIN (2)                      CREW (1)               FROM CABIN                             *****           TO CABIN    X
X                                                                M= 9356.                               *               M= 9355.    X
X  VOLUME        =  8000. CU-FT  NO OF MEN   =  3                T= 69.4                                *T= 68.9         T= 63.6    X
X  AIR MASS      = 594.12 LBM    TOTAL Q     = 1560.0 B/HR       A         -------------          ------------              A      X
X  TEMP          =   69.4 F      METABOLIC Q =  520.0 B/HR/MAN   A         |SENSIBLE   |          |SENSIBLE  |               A      X
X  DEW PT        =   51.1 F        SENSIBLE  =  330.9 B/HR/MAN   A         |HX FAN (4) | T= 70.7  |HX (5)    |               A      X
X  TOTAL PRESS   = 14.68 PSIA      LATENT    =  189.1 B/HR/MAN   AAAAAAAAA|Q  =  2843.|AAAAAAAAAA|Q=-16056. |AAAAAAAAAAAAAAA      X
X  O2 PRESS      =   2.89 PSIA   O2 USAGE    = 0.2543 PPH          -----> |CFM=  2100.|          |          |  ------->          X
X  CO2 PRESS     =   2.59 MM-HG  CO2 PROD    = 0.2995 PPH                 -------------           ------------                      X
X  GAS LEAKAGE   = 0.083 PPH                                                                            *                           X
X  O2 MAKEUP     = 0.000 PPH                                                                    M=1800. *                           X
X  N2 MAKEUP     = 0.000 PPH           FROM                                                     T= 60.0 *           TO CABIN        X
X  NON ECLSS Q:                        CABIN                                                    *********           M= 1390.        X
X    SENSIBLE    = 17065. B/HR         M= 1322.          ********                                 ---->             T= 50.6         X
X    LATENT      =   255. B/HR         T= 69.4           *                                                               A          X
X  ECLSS Q:                              A               *T= 54.3                                                        A A        X
X    SENSIBLE    =  3505. B/HR         | A      -------------                                             -------------  A |        X
X    LATENT      =   654. B/HR         | A  M= 1390. |REL. HUMD. |                           M= 1388.     |REL. HUMD. |  A |        X
X  REL HUMIDITY  = 51.77 PCT           V A  T= 70.8 |HX (7)     | T= 49.2      M= 1347.      T= 49.2      |HX FAN (12)|  A |        X
X                                      (31)AAAAAAAAAA|Q= -8880.  |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAA|Q  = 478.  |AAA |       X
X                                        A  ----->  |            |  -----> A                 A    ----->     |CFM= 300.  |            X
X                                      A A          -------------         | A ---------------  A           -------------             X
X                                      | A M= 67.19        *              | A |H2O SEP (10)|  A M= 41.6                             X
X                                      | A T= 98.6         *M= 950.     V AA|Q    =   13.  |AAA T= 50.5                              X
X                                      | A                 *T= 45.0         |CFM =    9.   |                                        X
X FROM CABIN                           | A              ******              ---------------                                         X
X M= 66.82                               A              ---->              M    ---->   H2O INTERFACE: M ADDED =    1.743            X
X T= 69.4                     ----------------                             MMMMMMMMMMM M=  1.4                                      X
X     A                       |SAND FAN (19)|                 <------                                                               X
X     A |                     |Q  = 171.     |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                              X
X     A |                     |CFM=  15.     |                        P= 28.63              A A                                     X
X     A V                     ----------------     M=  0.00-------------- M=  0.00          A |                                     X
X     A       M=  0.00                             T=288.6 |  AMINE     | T=180.3    M=  0.00 A |                                     X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)SSSSSSSSSS| BED 1 (16)|CCCCCCCCCC(17)AAAAAAAAA(18)                            X
X     A            ----->                       S     ---->  |Q    = 2406.|   ---->     C    ---->    A     TO CABIN                   X
X     A  H2O INTERFACE                          S            |MCO2= 0.017|              C          A A     M=  0.00                    X
X     A  M USED =    1.966                      S A          |MH2O= 3.582|              C |        | A     T=178.7                     X
X     A     M                                   S |          -------------              C |        | A        A                        X
X     A   | M                       M=   0.00   S |                          M=   0.00C |        | A      A A                        X
X   | A   | M M=  0.00                          S |                                     C |        | A      | A                        X
X   | A   V M T= 70.0                           S |                                     C V        A      | A                        X
X   | A --------        ----------              S                                       C          A      | A    -------------       X
X   | A |PUMP   |  T= 70.0|STEAM     | T=281.9  S        M=  0.00                       C     M=   0.00A    A M=   0.00 | CO2        | X
X   V A |(28)   |MMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|ACCUM (32)| X
X     A |Q=  0.|  ---->  |Q=     0.| ----->     S      <-----                            C     ---->     A         ---->  | M= 0.355 | X
X     A --------         ----------             S |                                     C A            A A              | P= 25.82 | X
X     A                             M=   0.00   S |                          M=   0.00C |              A |              ------------- X
X     A                                         S |                                     C |              A |                | C        X
X     A                                         S |       ------------- P= 14.68        C |              A |                | C        X
X     A                                         S V M= 66.82|  AMINE     | M= 67.19     C |              A |                V C        X
X     A        M= 66.82                         S   T= 69.4 | BED 2 (21)| T= 88.3       C     M= 67.19 A             TO OVBD OR       X
X     AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)AAAAAAAAA|Q    = -988.|AAAAAAAAA(22)AAAAAAAAAAAA             RECOVERY         X
X                  ----->                        ---->       |MCO2= 0.080|    ---->       ---->                   M=  0.27         X
X                                                            |MH2O= 2.046|                                        T=  70.0         X
X                                                            --------------                                                         X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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UNITED TECHNOLOGIES
HAMILTON STANDARD

TABLE A-3 (CONTINUED)

ESCM SAMPLE PROBLEM OUTPUT

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 SPACE STATION AIR REVITALIZATION SUBSYSTEM SAMD II DEMONSTRATION MODEL.  MISSION TIME:   5400. SEC ( 1.50 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                                       X
X          CABIN (2)                       CREW (1)               FROM CABIN                                *****            TO CABIN   X
X                                                                 M= 9361.                                  *                 M= 9360.  X
X  VOLUME       =  8000. CU-FT   NO OF MEN    =  3                T= 69.3                                   *T= 68.8          T= 63.5   X
X  AIR MASS     = 594.26 LBM     TOTAL Q      = 1755.0 B/HR        A         -------------           --------------               A     X
X  TEMP         =  69.3 F        METABOLIC Q =  585.0 B/HR/MAN     A         |SENSIBLE   |           |SENSIBLE    |               A     X
X  DEW PT       =  51.2 F          SENSIBLE  =  331.7 B/HR/MAN     A         |HX FAN (4) | T= 70.5   |HX (5)      |               A     X
X  TOTAL PRESS  = 14.69 PSIA        LATENT    =  253.3 B/HR/MAN     AAAAAAAAAA|Q  =  2843.|AAAAAAAAAAA|Q=-15985.   |AAAAAAAAAAAAAAAA     X
X  O2 PRESS     =  2.89 PSIA     O2 USAGE     = 0.2861 PPH           ----->  |CFM=  2100.|           |            |  ------->           X
X  CO2 PRESS    =  2.62 MM-HG    CO2 PROD     = 0.3370 PPH                   -------------           --------------                     X
X  GAS LEAKAGE = 0.083 PPH                                                                                  *                           X
X  O2 MAKEUP   = 0.000 PPH                                                                          M=1827. *                           X
X  N2 MAKEUP   = 0.000 PPH           FROM                                                           T= 60.0 *                TO CABIN   X
X  NON ECLSS Q:                      CABIN                                                          *********                M= 1391.   X
X    SENSIBLE   = 17065. B/HR        M= 1323.             ********                                   ---->                   T= 50.5    X
X    LATENT     =   255. B/HR        T= 69.3              *                                                                      A     X
X  ECLSS Q:                             A                 *T= 54.1                                                               A A   X
X    SENSIBLE   =  3505. B/HR         | A           --------------                                                -------------   A |   X
X    LATENT     =   586. B/HR         | A  M= 1391.|REL. HUMD.  |                                 M= 1389.      |REL. HUMD. |   A |   X
X  REL HUMIDITY = 52.20 PCT           V A  T= 70.1 |HX (7)      | T= 49.1        M= 1348.         T= 49.1       |HX FAN (12)|   A |   X
X                                    (31)AAAAAAAAAAA|Q= -8668.   |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAAAAA|Q  = 478.  |AAA |    X
X                                       A   ----->  |            |   -----> A                   A     ----->      |CFM= 300.  |         X
X                                     A A           --------------          | A --------------  A                 -------------         X
X                                     | A M= 67.21        *                 | A |H2O SEP (10)|  A M= 41.7                               X
X                                     | A T= 86.1         *M= 950.           V AA|Q   =  13.  |AAA T= 50.4                               X
X                                     | A                 *T= 45.0               |CFM =   9.  |                                          X
X FROM CABIN                          | A            ******                      --------------                                          X
X M= 66.86                              A            ---->                            M   ---->   H2O INTERFACE: M ADDED =   2.450       X
X T= 69.3                     ----------------                                        MMMMMMMMMMM M=  1.4                                X
X     A                       |SAMD FAN (19)|                  <-------                                                                 X
X     A |                     |Q  = 171.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                                 X
X     A |                     |CFM=  15.    |                              P= 28.63                  A A                                X
X     A V                     ---------------       M=  0.00-------------- M=  0.00                  A |                                X
X     A      M=  0.00                               T=288.6  |  AMINE    | T=180.3         M=  0.00  A |                                X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)SSSSSSSSSS| BED 1 (16)|CCCCCCCCCC(17)AAAAAAAAA(18)                                   X
X     A                  ----->                S    ---->   |Q   = 2406.|    ---->     C   ---->   A     TO CABIN                     X
X     A  H2O INTERFACE                         S            |MCO2= 0.017|              C          A A     M=  0.00                     X
X     A  M USED =   1.966                      S A          |MH2O= 3.582|              C |        | A     T=178.7                      X
X     A    M                                   S |          -------------              C |        | A       A                          X
X     A  | M                            M=  0.00 S |                            M=  0.00C |        | A     A A                          X
X   | A  | M M=  0.00                          S |                                     C |        | A     | A                          X
X   | A  V M T= 70.0                           S |                                     C V          A     | A          -------------   X
X   | A ---------         -----------          S                                       C            A     | A          | CO2       |   X
X   | A |PUMP   |  T= 70.0|STEAM    | T=275.3   S     M=  0.00                          C   M=  0.00A       A M=  0.00 |ACCUM (32)|    X
X   V A |(28)   |MMMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|           |   X
X     A |Q=  0.|  ---->  |Q=    0.| ----->     S     <-----                            C   ---->   A          ---->  | M= 0.317 |    X
X     A ---------         -----------          S |                                     C A          A A                | P= 23.00 |    X
X     A                                 M=  0.00 S |                            M=  0.00C |          A |                -------------   X
X     A                                         S |                                     C |          A |                    | C         X
X     A                                         S |        ------------- P= 14.69      C |          A |                    | C         X
X     A                                         S V M= 66.86|  AMINE    | M= 67.21      C |          A |                    V C         X
X     A      M= 66.86                          S   T= 69.3 | BED 2 (21)| T= 75.8       C   M= 67.21 A                    TO OVBD OR    X
X     AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)AAAAAAAAAA|Q   = -718.|AAAAAAAAAA(22)AAAAAAAAAAAA                        RECOVERY     X
X                        ----->                    ---->  |MCO2= 0.204|   ---->          ---->                        M=  0.00     X
X                                                          |MH2O= 1.752|                                                 T= 70.0      X
X                                                          -------------                                                               X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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TABLE A-3 (CONTINUED)

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SPACE STATION AIR REVITALIZATION SUBSYSTEM SAWD II DEMONSTRATION MODEL.  MISSION TIME:    7200. SEC ( 2.00 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                              X
X          CABIN (2)                        CREW (1)               FROM CABIN                          *****         TO CABIN  X
X                                                                  M= 9368.                            *              M= 9367. X
X VOLUME        =  8000. CU-FT  NO OF MEN    = 3                    T= 69.2                             *T= 68.6       T= 63.4  X
X AIR MASS      = 594.73 LBM    TOTAL Q      = 1950.0 B/HR           A            -------------     -------------           A   X
X TEMP          =   69.2 F      METABOLIC Q =  650.0 B/HR/MAN        A           |SENSIBLE    |     |SENSIBLE    |           A   X
X DEW PT        =   52.7 F        SENSIBLE   =  332.1 B/HR/MAN        A           |HX FAN (4) | T= 70.4 |HX (5)    |         A   X
X TOTAL PRESS   = 14.70 PSIA       LATENT    =  317.9 B/HR/MAN        AAAAAAAAA|Q  =   2843.|AAAAAAAAAA|Q=-16016. |AAAAAAAAAAAAAAAA X
X O2 PRESS      =   2.89 PSIA   O2 USAGE     = 0.3178 PPH               -----> |CFM=  2100.|          |          |   -------->  X
X CO2 PRESS     =   2.78 MM-HG  CO2 PROD     = 0.3744 PPH                      -------------          -------------              X
X GAS LEAKAGE   = 0.083 PPH                                                                              *                     X
X O2 MAKEUP     = 0.000 PPH                                                                         M=1869. *                  X
X N2 MAKEUP     = 0.000 PPH           FROM                                                          T= 60.0 *      TO CABIN    X
X NON ECLSS Q:                        CABIN                                                         *********      M= 1378.    X
X   SENSIBLE    = 17065. B/HR         M= 1336.           ********                                     ---->        T= 55.1     X
X   LATENT      =    255. B/HR        T= 69.2            *                                                          A          X
X ECLSS Q:                              A                *T= 63.6                                                    A A        X
X   SENSIBLE    =  3685. B/HR         | A          -------------                                       ------------ A |        X
X   LATENT      = 10797. B/HR         | A  M= 1382.|REL. HUMD. |                          M= 1372.    |REL. HUMD. | A |        X
X REL HUMIDITY = 55.51 PCT            V A   T= 74.1 |HX (7)     | T= 53.6     M= 1330.    T= 53.7     |HX FAN (12)| A |        X
X                                     (31)AAAAAAAAAA|Q=-17637.  |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAA|Q  = 478.  |AAA |   X
X                                       A   ----->  |           |  -----> A             A    ----->  |CFM= 300.  |        X
X                                     A A          -------------       | A -------------- A          ------------             X
X                                     | A M= 45.94      *              | A |H2O SEP (10)| A M= 41.1                            X
X                                     | A T=194.1       *M= 950.       V AA|Q   =  13.  |AAA T= 54.9                            X
X                                     | A               *T= 45.0          |CFM =   9.  |                                      X
X FROM CABIN                          | A           ******                -------------                                       X
X M= 33.52                              A           ---->                   M   ---->   H2O INTERFACE: M ADDED =   4.169      X
X T= 69.2                        ---------------                            MMMMMMMMMMM M= 10.0                               X
X      A                         |SAWD FAN (19)|               <------                                                        X
X      A |                       |Q  = 171.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                        X
X      A |                       |CFM=   8.    |                    P= 17.45                A A                                X
X      A V                       ---------------    M=  0.16------------- M=  0.00          A |                                X
X      A        M=  0.00                            T=281.9 |  AMINE    | T= 96.9   M=  0.00 A |                               X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)SSSSSSSSSS| BED 1 (16)|CCCCCCCCCC(17)AAAAAAAAA(18)                        X
X      A                      ----->          S    ---->   |Q    = 115.|   ---->   C    ---->   A    TO CABIN                X
X      A  H2O INTERFACE                       S            |MCO2= 0.128|           C          A A    M=  0.00                X
X      A  M USED =    2.394                   S A          |MH2O= 2.873|           C |          | A    T= 88.0                 X
X      A    M                                 S |          -------------           C |          | A       A                    X
X      A   | M                       M=  0.16 S |                        M=  0.00C |          | A     A A                    X
X    | A   | M M=  0.16                       S |                                  C |          | A     | A                    X
X    | A   V M T= 70.0                        S |                                  C V            A     | A                    X
X    | A --------     ----------              S                                    C              A     | A   -------------    X
X    | A |PUMP  | T=288.5|STEAM   | T=281.9   S     M=  0.00                       C     M=  0.00A      A M=  0.00 |ACCUM (32)| X
X    V A |(28)  |MMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|         | X
X      A |Q= 34.| ---->  |Q=  146.| ----->   S     <-----                          C    ---->   A        ----> | M= 0.343 | X
X      A --------         ----------          S |                                  C A          A A             | P= 25.83 | X
X      A                             M=  0.00 S |                        M=  0.00C |            A |             ------------ X
X      A                                      S |                                  C |            A |               | C        X
X      A                                      S |       ------------- P= 14.70     C |            A |               | C        X
X      A                                      S V M= 33.52|  AMINE    | M= 45.94   C |            A |               V C        X
X      A        M= 33.52                      S  T= 69.2 | BED 2 (21)| T=181.3    C    M= 45.94 A             TO OVBD OR    X
X      AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)AAAAAAAAAA|Q    =******|AAAAAAAAAA(22)AAAAAAAAAAAA             RECOVERY      X
X                        ----->               ---->        |MCO2= 0.014|   ---->            ---->               M=  0.27      X
X                                                          |MH2O= 2.420|                                        T= 70.0       X
X                                                          -------------                                                      X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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TABLE A-3 (CONTINUED)

ESCM SAMPLE PROBLEM OUTPUT

```
 SPACE STATION AIR REVITALIZATION SUBSYSTEM SAMD II DEMONSTRATION MODEL.  MISSION TIME:    9000. SEC ( 2.50 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                              X
X         CABIN (2)                     CREW (1)              FROM CABIN                             *****           TO CABIN  X
X                                                             M= 9366.                               *                M= 9368. X
X  VOLUME       =  8000. CU-FT  NO OF MEN    =  3              T= 69.3                                *T= 70.2         T= 65.5  X
X  AIR MASS     = 594.76 LBM    TOTAL Q      = 1950.0 B/HR      A         -------------         ------------            A     X
X  TEMP         =  69.3 F       METABOLIC Q =  650.0 B/HR/MAN   A         |SENSIBLE   |         |SENSIBLE   |           A     X
X  DEW PT       =  52.5 F         SENSIBLE  =  331.4 B/HR/MAN   A         |HX FAN (4) | T= 70.5 |HX (5)     |           A     X
X  TOTAL PRESS  = 14.70 PSIA      LATENT    =  318.6 B/HR/MAN   AAAAAAAAA|Q  =  2843.|AAAAAAAAAA|Q=-11366.  |AAAAAAAAAAAAAAA X
X  O2 PRESS     =  2.89 PSIA    O2 USAGE     = 0.3178 PPH          -----> |CFM=  2100.|          |           |   ------->     X
X  CO2 PRESS    =  2.83 MM-HG   CO2 PROD     = 0.3744 PPH                 -------------          ------------                  X
X  GAS LEAKAGE  = 0.083 PPH                                                                           *                        X
X  O2 MAKEUP    = 0.000 PPH                                                                   M=1116. *                        X
X  N2 MAKEUP    = 0.000 PPH          FROM                                                     T= 60.0 *        TO CABIN        X
X  NON ECLSS Q:                      CABIN                                                    *********        M= 1391.        X
X    SENSIBLE   = 17065. B/HR        M= 1346.            ********                                ---->         T= 50.7         X
X    LATENT     =   255. B/HR        T= 69.3             *                                                          A          X
X  ECLSS Q:                            A                 *T= 54.5                                                   A A        X
X    SENSIBLE   =  3684. B/HR        | A           -------------                                     -------------  A |        X
X    LATENT     =   514. B/HR        | A   M= 1391.|REL. HUMD. |                          M= 1389.   |REL. HUMD. |  A |        X
X  REL HUMIDITY = 54.89 PCT          V A   T= 70.1 |HX (7)     | T= 49.3      M= 1348.    T= 49.3    |HX FAN (12)|  A |        X
X                                    (31)AAAAAAAAAA|Q= -9063.  |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAAA|Q  = 478.  |AAA |        X
X                                      A   ----->  |           |   -----> A            A    ----->     |CFM= 300.  |             X
X                                    A A           -------------         | A --------------  A         -------------             X
X                                    | A M= 44.89        *                | A |H2O SEP (10)|  A M= 41.7                          X
X                                    | A T= 96.3         *M= 950.        V AA|Q   =  13.  |AAA T= 50.6                          X
X                                    | A                 *T= 45.0            |CFM =   9.  |                                     X
X FROM CABIN                         | A             ******                  --------------                                    X
X M= 44.61                             A             ---->                         M   ---->   H2O INTERFACE: M ADDED =   5.583 X
X T= 69.3                    ---------------                                       MMMMMMMMMMM M=  1.8                         X
X     A                      |SAMD FAN (19)|             <------                                                               X
X     A |                    |Q  = 171.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                              X
X     A |                    |CFM=  10.    |                         P= 23.14               A A                                X
X     A V                    ---------------    M=  0.16------------- M=  0.00               A |                                X
X     A       M=  0.00                          T=275.7 |  AMINE    | T=139.8      M=  0.00  A |                                X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)SSSSSSSSSS| BED 1 (16)|CCCCCCCCCC(17)AAAAAAAAA(18)                               X
X     A                ----->               S    ---->  |Q   =  251.|   ---->    C     ---->    A      TO CABIN                 X
X     A  H2O INTERFACE                      S           |MCO2= 0.123|            C            A A     M=  0.00                 X
X     A  M USED =    2.472                  S A         |MH2O= 2.946|            C |          | A     T=139.8                  X
X     A    M                                S |         -------------            C |          | A       A                      X
X     A  | M                       M=  0.16 S |                       M=  0.00C |          | A     A A                      X
X   | A  | M M=  0.16                       S |                                  C |          | A     | A                      X
X   | A  V M T= 70.0                        S |                                  C V          A     | A                      X
X   | A --------    ----------              S                                    C            A     | A        ------------  X
X   | A |PUMP  |  T=288.5|STEAM    | T=275.7  S     M=  0.00                       C   M=  0.00A     A M=  0.00 | CO2       |  X
X   V A |(28)  |MMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|ACCUM (32)|  X
X     A |Q= 34.|  ---->  |Q=  146.| ----->  S    <-----                         C    ---->   A        ----> | M= 0.307 |  X
X     A --------    ----------              S |                                  C A          A A             | P= 23.14 |  X
X     A                            M=  0.00 S |                       M=  0.00C |          A |             ------------  X
X     A                                     S |                                  C |          A |               | C          X
X     A                                     S |         -------------- P= 14.70  C |          A |               | C          X
X     A                                     S V M= 44.61|  AMINE     | M= 44.89  C |          A |               V C          X
X     A       M= 44.61                      S   T= 69.3 | BED 2 (21)| T= 80.9    C   M= 44.89 A            TO OVBD OR      X
X    AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)AAAAAAAAAA|Q   = -663.|AAAAAAAAAA(22)AAAAAAAAAAAA              RECOVERY        X
X                      ----->                   ---->   |MCO2= 0.145|   ---->       ---->                 M=  0.00        X
X                                                       |MH2O= 1.670|                                     T= 70.0         X
X                                                       -------------                                                     X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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TABLE A-3 (CONTINUED)

ESCM SAMPLE PROBLEM OUTPUT

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SPACE STATION AIR REVITALIZATION SUBSYSTEM SAND II DEMONSTRATION MODEL.  MISSION TIME:  12600. SEC ( 3.50 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                       X
X        CABIN (2)                   CREW (1)              FROM CABIN                          *****          TO CABIN  X
X                                                          M= 9374.                            *              M= 9373.  X
X VOLUME       =  8000. CU-FT  NO OF MEN    = 3             T= 68.8                             *T= 68.2       T= 63.3   X
X AIR MASS     = 595.06 LBM    TOTAL Q      = 1950.0 B/HR    A              -------------      -----------        A     X
X TEMP         =   68.8 F      METABOLIC Q =  650.0 B/HR/MAN A             |SENSIBLE   |      |SENSIBLE  |        A     X
X DEW PT       =   53.0 F        SENSIBLE  =  336.1 B/HR/MAN A             |HX FAN (4) | T= 70.1 |HX (5) |        A     X
X TOTAL PRESS  = 14.69 PSIA      LATENT    =  313.9 B/HR/MAN AAAAAAAAA|Q  =  2843.|AAAAAAAAAA|Q=-15498. |AAAAAAAAAAAAAAA X
X O2 PRESS     =  2.89 PSIA    O2 USAGE    = 0.3178 PPH         ----> |CFM=  2100.|          |          |  ------->      X
X CO2 PRESS    =  3.02 MM-HG   CO2 PROD    = 0.3744 PPH               -------------          -----------               X
X GAS LEAKAGE  = 0.083 PPH                                                                        *                    X
X O2 MAKEUP    = 0.000 PPH                                                                  M=1880. *                  X
X N2 MAKEUP    = 0.000 PPH          FROM                                                    T= 60.0 *     TO CABIN     X
X NON ECLSS Q:                      CABIN                                                   *********     M= 1391.     X
X   SENSIBLE   = 17065. B/HR        M= 1323.        ********                                  ---->       T= 50.9      X
X   LATENT     =   255. B/HR        T= 68.8         *                                                          A       X
X ECLSS Q:                             A            *T= 54.9                                                   A A     X
X   SENSIBLE   =  4461. B/HR          | A          -------------                                 ------------- A |     X
X   LATENT     =   689. B/HR          | A   M= 1391.|REL. HUMD. |                 M= 1388.      |REL. HUMD. |  A |     X
X REL HUMIDITY = 56.83 PCT           V A   T= 70.1 |HX (7)     | T= 49.4    M= 1347.    T= 49.5 |HX FAN (12)|  A |     X
X                                   (31)AAAAAAAAAA|Q= -9376.  |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAA|Q  = 478. |AAA |     X
X                                      A   ----->  |           |  -----> A         A    ----->  |CFM= 300.  |        X
X                                    A A           -------------        | A -------------- A    -------------        X
X                                    | A M= 67.30        *              | A |H2O SEP (10)| A M= 41.7                 X
X                                    | A T= 95.9         *M= 950.       V AA|Q   =  13.  |AAA T= 50.7                X
X                                    | A                 *T= 45.0           |CFM =   9.  |                          X
X FROM CABIN                         | A             ******                --------------                           X
X M= 66.95                              A             ---->              M  ---->   H2O INTERFACE: M ADDED =   8.219  X
X T= 68.8                        ---------------                         MMMMMMMMMMM M=  2.2                         X
X     A                          |SAND FAN (19)|                <------                                              X
X     A |                        |Q  = 171.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                      X
X     A |                        |CFM=  15.    |                   P= 14.69            A A                           X
X     A V                        ---------------  M= 66.95------------- M= 67.30         A |                          X
X     A          M= 66.95                         T= 68.8 |  AMINE    | T= 85.7   M= 67.30  A |                      X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)AAAAAAAAAA| BED 1 (16)|AAAAAAAAAA(17)AAAAAAAAA(18)                   X
X     A                  ----->            S    ---->  |Q    = -992.|  ---->   C    ---->   A    TO CABIN           X
X     A  H2O INTERFACE                     S           |MCO2= 0.089|           C         A A    M=  0.00           X
X     A  M USED =   2.829                  S A         |MH2O= 1.710|           C |       | A    T=150.1            X
X     A    M                               S |         -------------           C |       | A      A                X
X     A  | M                  M=   0.00    S |                     M=   0.00C |       | A     A A                X
X   | A  | M M=  0.83                      S |                                 C |       | A     | A                X
X   | A  V M T= 70.0                       S |                                 C V         A     | A    ----------- X
X   | A --------       -----------         S                                   C           A     | A    | CO2      | X
X   | A |PUMP  |  T=111.1|STEAM    | T=289.9  S      M=  0.00                  C     M=  0.02A     A M=  0.02 |ACCUM (32)| X
X   V A |(28)  |MMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|          | X
X     A |Q= 34.|  ---->   |Q=  922.| ----->  S        <-----                    C     ---->  A       -----> | M= 0.389 | X
X     A --------       -----------         S |                                 C A           A A            | P= 29.78 | X
X     A                      M=   0.83     S |                       M=   0.02C |           A |            ----------- X
X     A                                    S |                                 C |           A |              | C      X
X     A                                    S |           ------------- P= 29.86  C |           A |              | C      X
X     A                                    S V M=   0.83|  AMINE    | M=  0.02   C |           A |              V C      X
X     A           M=   0.00                S   T=289.9  | BED 2 (21)| T=150.1    C    M=  0.00 A            TO OVBD OR X
X     AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)SSSSSSSSSS|Q    =  821.|CCCCCCCCCC(22)AAAAAAAAAAA              RECOVERY  X
X                        ----->               ---->    |MCO2= 0.262|  ---->          ---->                M=  0.27   X
X                                                      |MH2O= 1.816|                                      T= 70.0    X
X                                                      -------------                                                 X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```
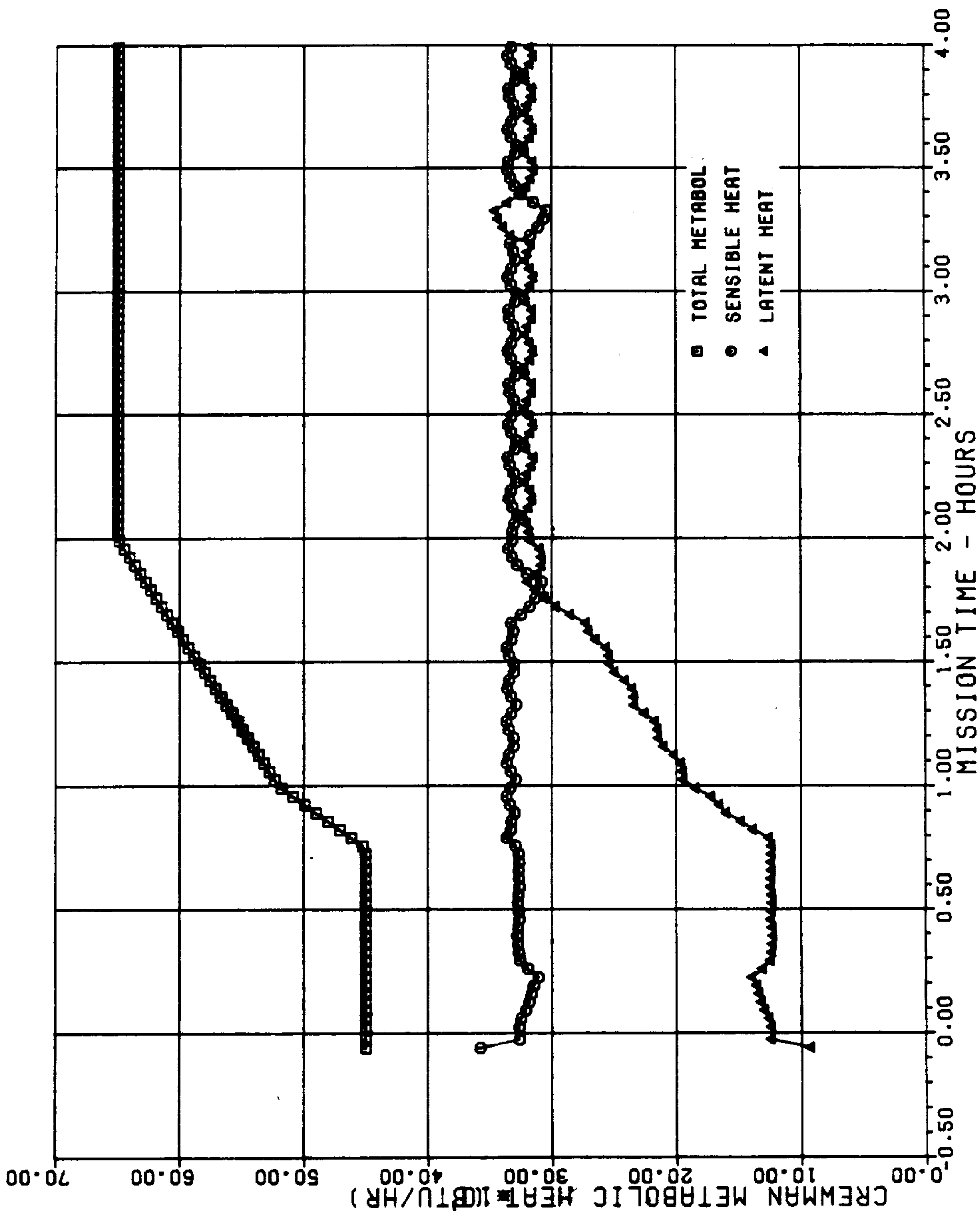

TABLE A-3 (CONTINUED)

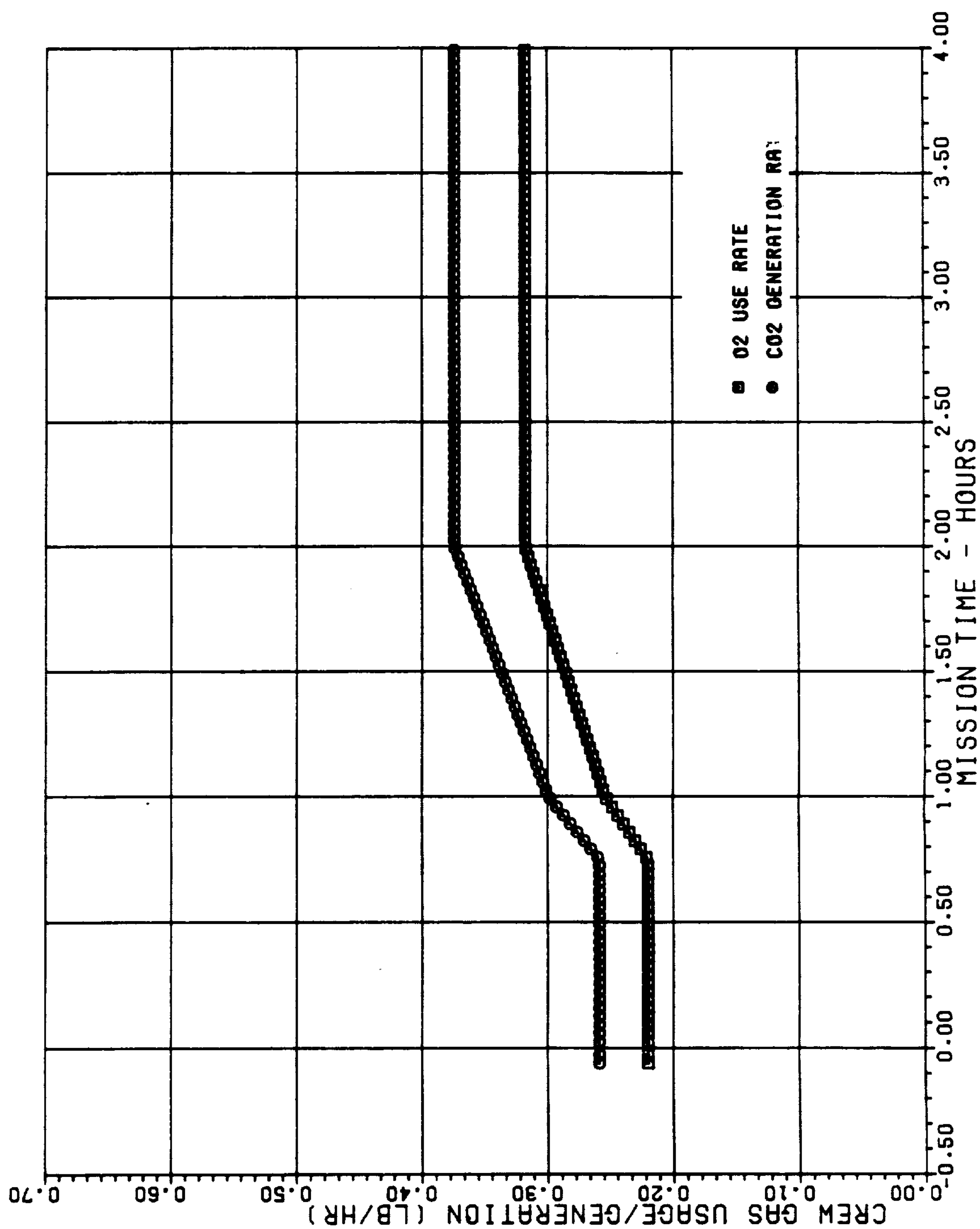
ESCM SAMPLE PROBLEM OUTPUT

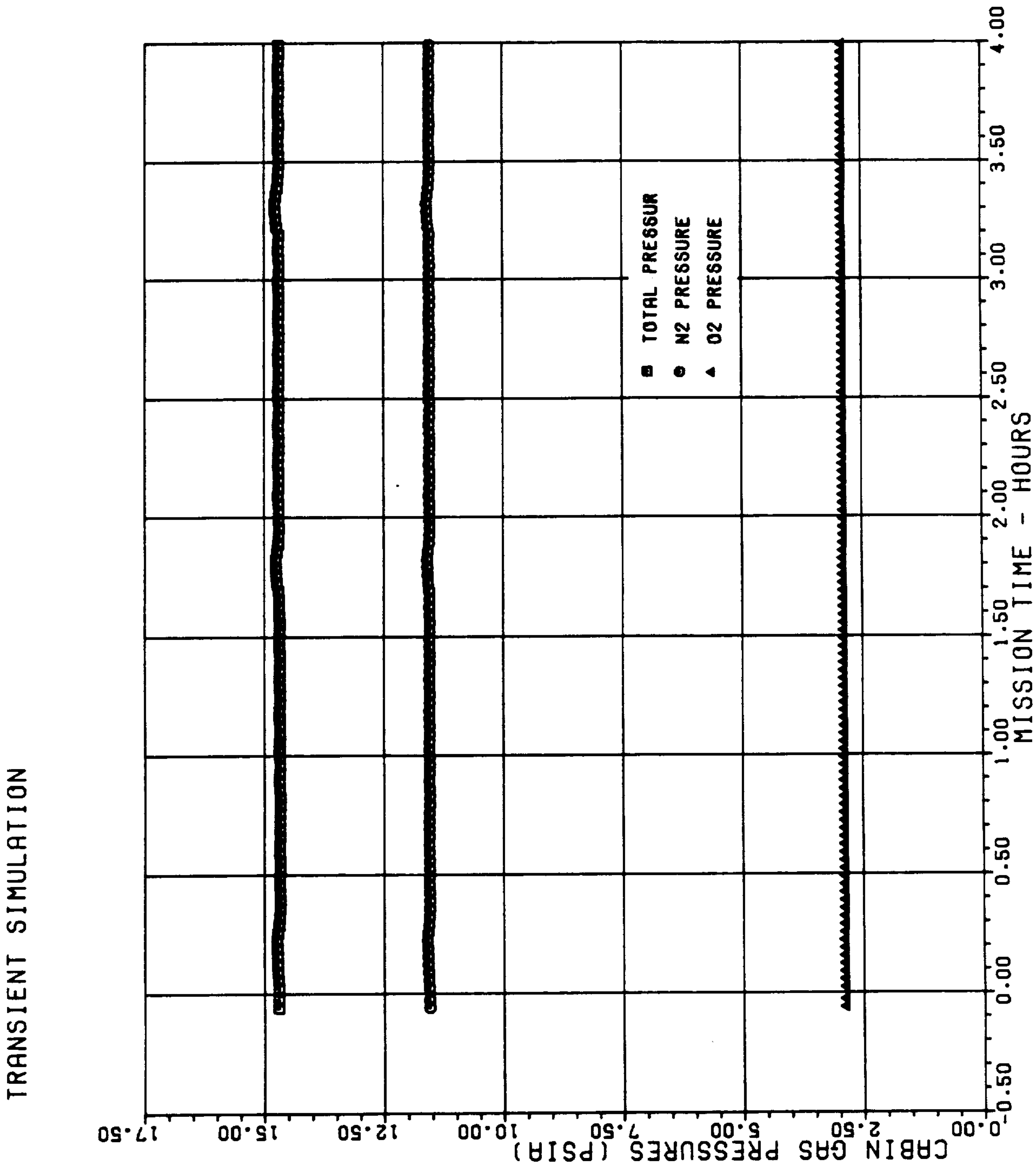
```
 SPACE STATION AIR REVITALIZATION SUBSYSTEM SAMD II DEMONSTRATION MODEL.  MISSION TIME:  14400. SEC ( 4.00 HR)   DATE: 02/10/87

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X                                                                                                                                 X
X          CABIN (2)  -                   CREW (1)              FROM CABIN                             *****           TO CABIN   X
X                                                               M= 9370.                               *                M= 9372.  X
X  VOLUME       =  8000. CU-FT   NO OF MEN   =  3                T= 69.3                                *T= 70.2         T= 65.6   X
X  AIR MASS     = 595.01 LBM     TOTAL Q     = 1950.0 B/HR        A        -------------          ------------             A     X
X  TEMP         =  69.3 F        METABOLIC Q =  650.0 B/HR/MAN    A        |SENSIBLE    |         |SENSIBLE   |              A     X
X  DEW PT       =  52.4 F          SENSIBLE  =  331.4 B/HR/MAN    A        |HX FAN (4)  | T= 70.5 |HX (5)     |              A     X
X  TOTAL PRESS  = 14.70 PSIA       LATENT    =  318.6 B/HR/MAN    AAAAAAAAA|Q  =  2843.|AAAAAAAAAA|Q=-11276.  |AAAAAAAAAAAAAAA       X
X  O2 PRESS     =  2.90 PSIA     O2 USAGE    = 0.3178 PPH           -----> |CFM=  2100.|          |           |  ------->          X
X  CO2 PRESS    =  3.08 MM-HG    CO2 PROD    = 0.3744 PPH                  -------------          ------------                     X
X  GAS LEAKAGE  = 0.083 PPH                                                                              *                        X
X  O2 MAKEUP    = 0.000 PPH                                                                       M=1106. *                       X
X  N2 MAKEUP    = 0.000 PPH            FROM                                                       T= 60.0 *          TO CABIN     X
X  NON ECLSS Q:                        CABIN                                                      *********          M= 1392.     X
X    SENSIBLE   = 17065. B/HR          M= 1347.           ********                                  ---->            T= 50.7      X
X    LATENT     =   255. B/HR          T= 69.3            *                                                              A        X
X  ECLSS Q:                              A                *T= 54.5                                                       A A      X
X    SENSIBLE   =  4461. B/HR          | A          -------------                                        -------------  A |      X
X    LATENT     =   498. B/HR          | A   M= 1392.|REL. HUMD. |                            M= 1390.   |REL. HUMD. |  A |      X
X  REL HUMIDITY = 54.61 PCT            V A   T= 70.2 |HX (7)     | T= 49.3      M= 1348.      T= 49.3    |HX FAN (12)|  A |      X
X                                      (31)AAAAAAAAAA|Q= -9029.  |AAAAAAAAA(9)AAAAAAAAAAAAAAA(11)AAAAAAAAAAAAAA|Q  = 478.  |AAA |      X
X                                        A   ----->  |           |   -----> A               A    ----->   |CFM= 300.  |           X
X                                      A A          -------------         | A --------------  A          -------------            X
X                                      | A M= 44.90         *             | A |H2O SEP (10)|  A M= 41.7                           X
X                                      | A T= 99.5          *M= 950.      V AA|Q   =  13.  |AAA T= 50.6                           X
X                                      | A                  *T= 45.0          |CFM =   9.  |                                       X
X FROM CABIN                           | A             ******                 --------------                                      X
X M= 44.63                               A             ---->                        M   ---->  H2O INTERFACE: M ADDED =   9.169    X
X T= 69.3                      ---------------                                     MMMMMMMMMMM M=  1.8                           X
X     A                        |SAMD FAN (19)|              <------                                                               X
X     A |                      |Q  = 171.    |AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA                              X
X     A |                      |CFM=  10.    |                           P= 14.70                A A                              X
X     A V                      ---------------       M= 44.63------------- M= 44.90                A |                              X
X     A        M= 44.63                              T= 69.3 |  AMINE    | T= 84.1      M= 44.90  A |                              X
X   (14)AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(15)AAAAAAAAAA| BED 1 (16)|AAAAAAAAAA(17)AAAAAAAAA(18)                               X
X     A                  ----->                S     ---->  |Q   = -681.|   ---->   C    ---->  A     TO CABIN                    X
X     A  H2O INTERFACE                         S            |MCO2= 0.204|           C          A A    M=  0.00                    X
X     A  M USED =    3.244                     S A          |MH2O= 1.459|           C |        | A    T=159.0                     X
X     A    M                                   S |          -------------           C |        | A      A                         X
X     A  | M                         M=  0.00  S |                          M=  0.00C |        | A    A A                         X
X   | A  | M M=  0.83                          S |                                  C |        | A    | A                         X
X   | A  V M T= 70.0                           S |                                  C V          A    | A      ------------       X
X   | A --------         ----------            S                                    C            A    | A      | CO2        |     X
X   | A |PUMP   |  T=111.1|STEAM    | T=290.1  S      M=  0.00                      C     M=  0.00A     A M=  0.00 |ACCUM (32)|     X
X   V A |(28)   |MMMMMMMMM|GEN (29)|SSSSSSSS(25/26)SSSSSSSSSSSSSSSSSSSSSSSSSSSSSSS(23/24)CCCCCCCC)A(CCCC(30)CCCCCCCC|          |     X
X     A |Q= 34.|  ---->  |Q=  922.| ----->     S      <-----                        C    ---->  A         ----> | M= 0.405 |     X
X     A --------         ----------            S |                                  C A         A A            | P= 29.92 |     X
X     A                              M=  0.83  S |                         .M=  0.00C |         A |            ------------     X
X     A                                        S |                                  C |         A |               | C           X
X     A                                        S |          ------------- P= 29.91  C |         A |               | C           X
X     A                                        S V M=  0.83|  AMINE    | M=  0.00   C |         A |               V C           X
X     A        M=  0.00                        S   T=290.1 | BED 2 (21)| T=159.1    C   M=  0.00 A             TO OVBD OR       X
X     AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA(20)SSSSSSSSSS|Q    =  674.|CCCCCCCCCC(22)AAAAAAAAAAA                RECOVERY        X
X                        ----->                   ---->     |MCO2= 0.109|   ---->      ---->                   M=  0.27        X
X                                                           |MH2O= 2.218|                                      T= 70.0         X
X                                                           -------------                                                      X
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```

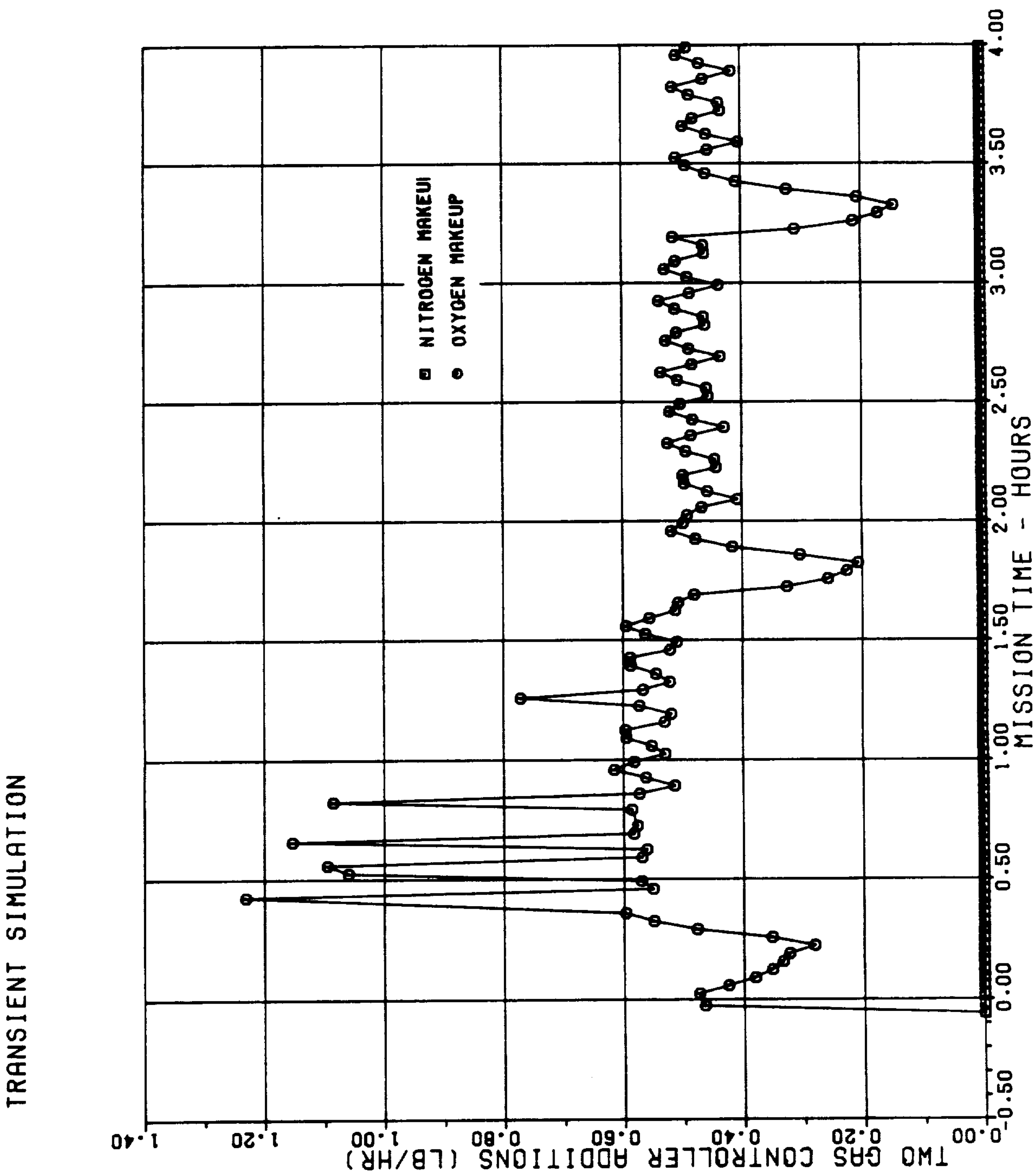
TRANSIENT SIMULATION

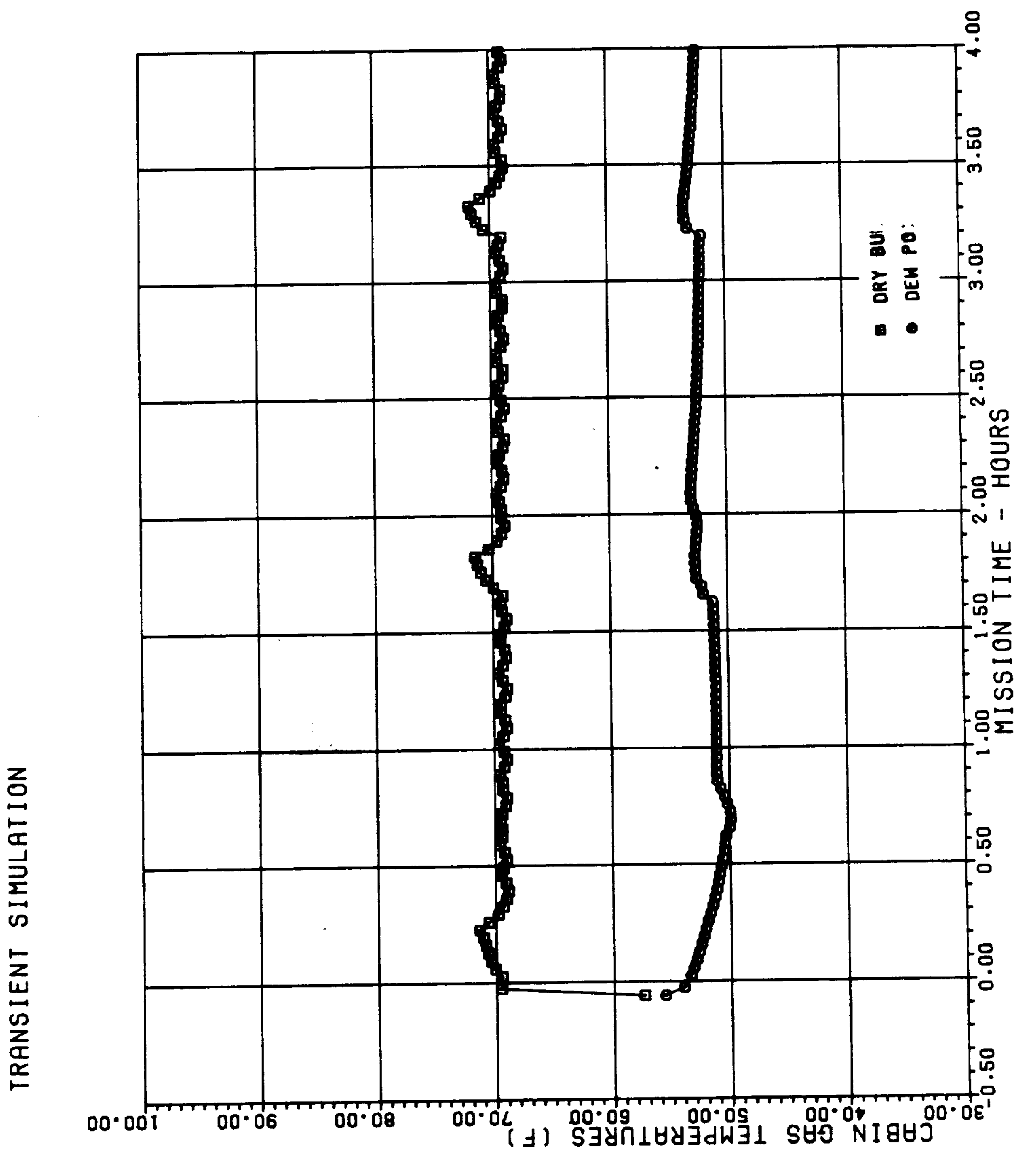


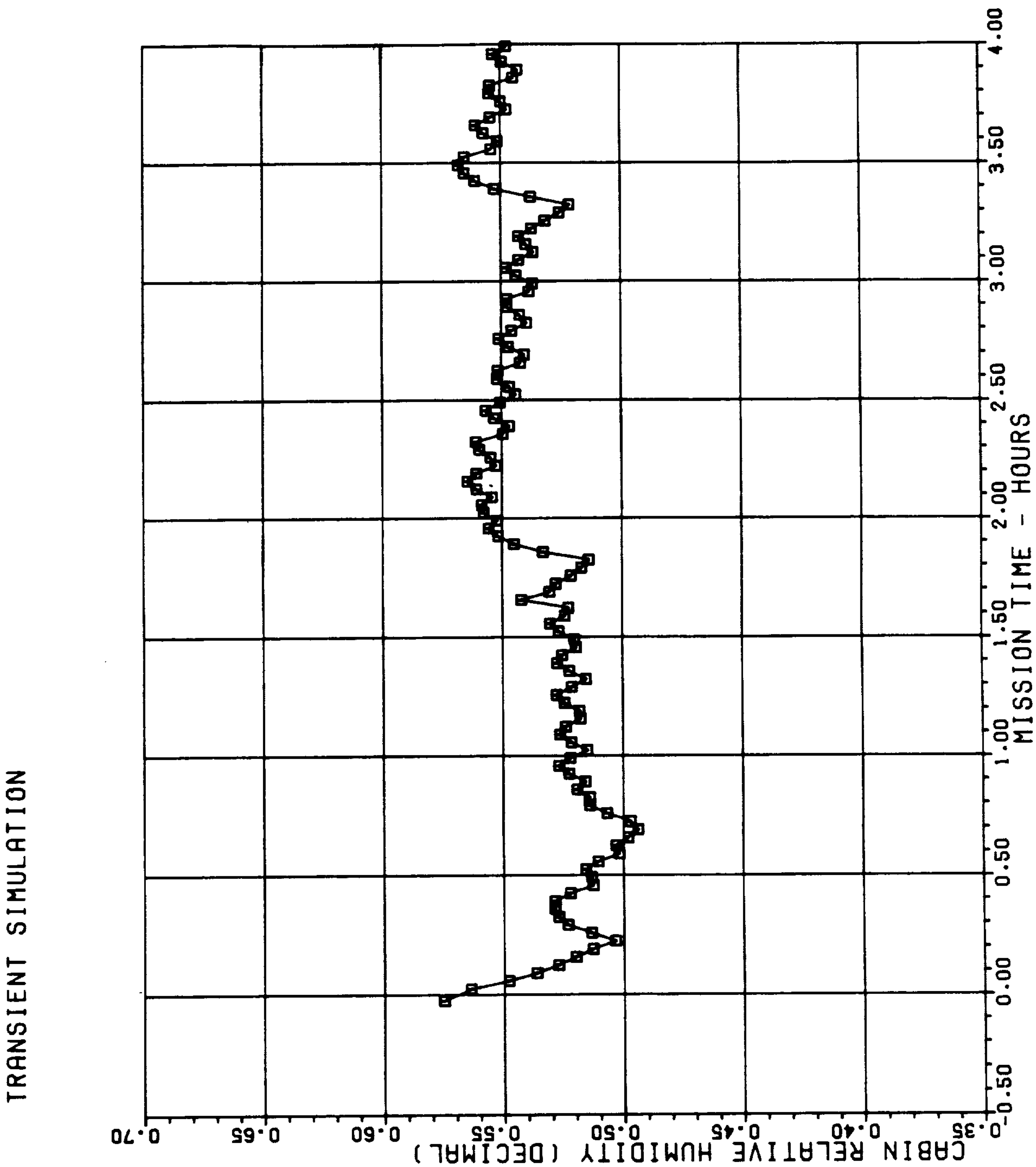
TRANSIENT SIMULATION

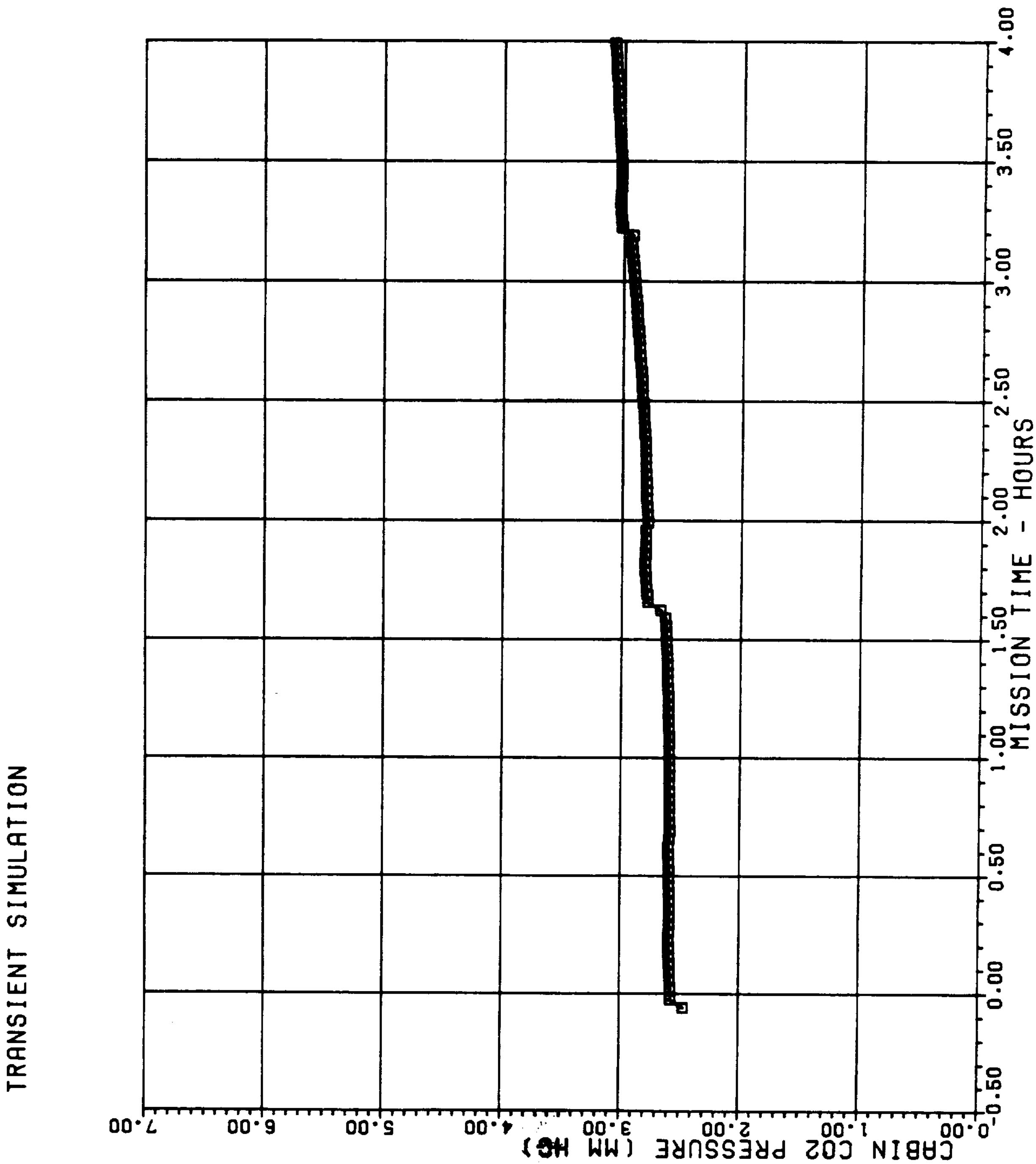


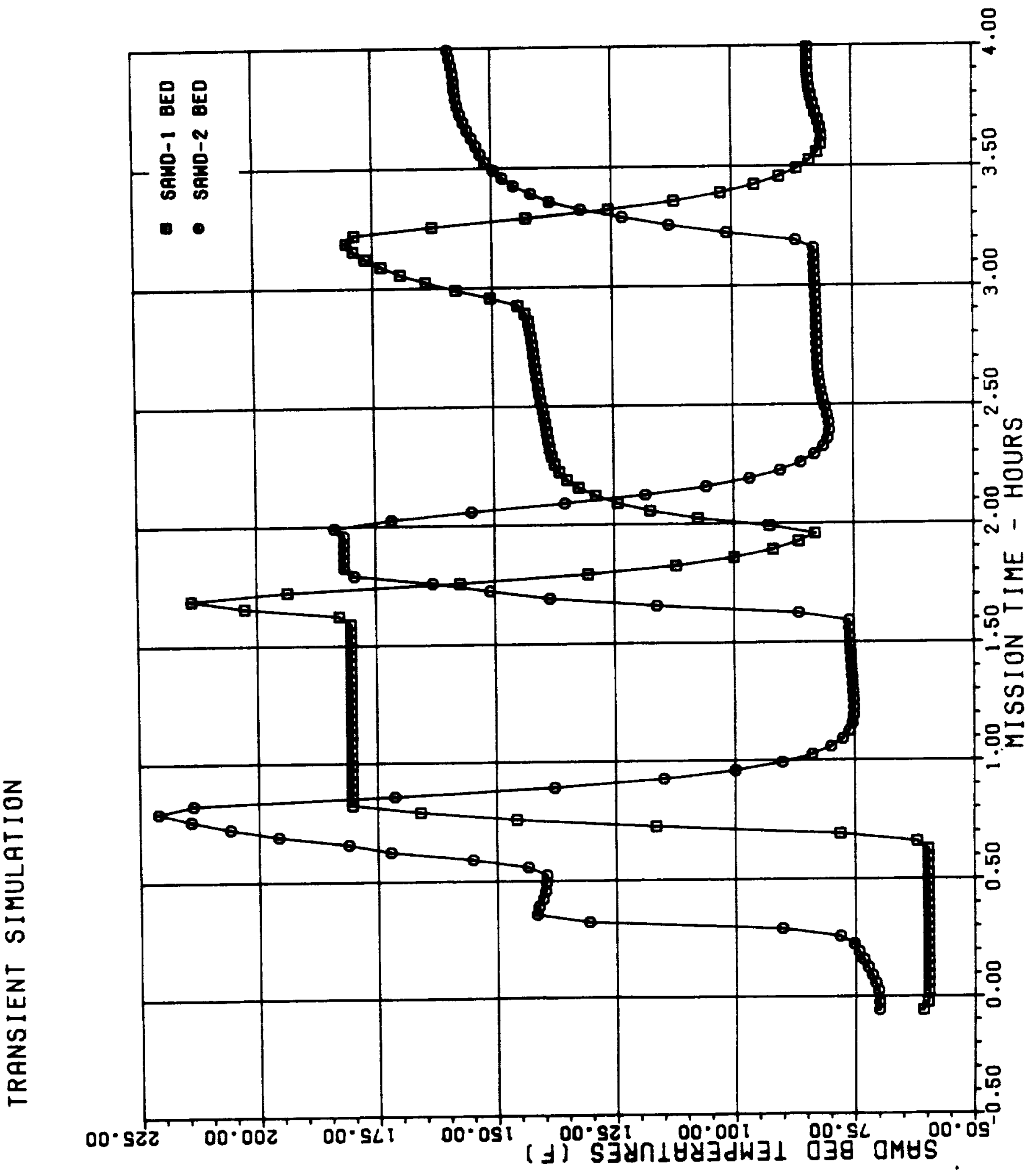

TRANSIENT SIMULATION
TOTAL PRESSUR
N2 PRESSURE
O2 PRESSURE
MISSION TIME - HOURS
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
CABIN GAS PRESSURES (PSIA)
0.00
2.50
5.00
7.50
10.00
12.50
15.00
17.50

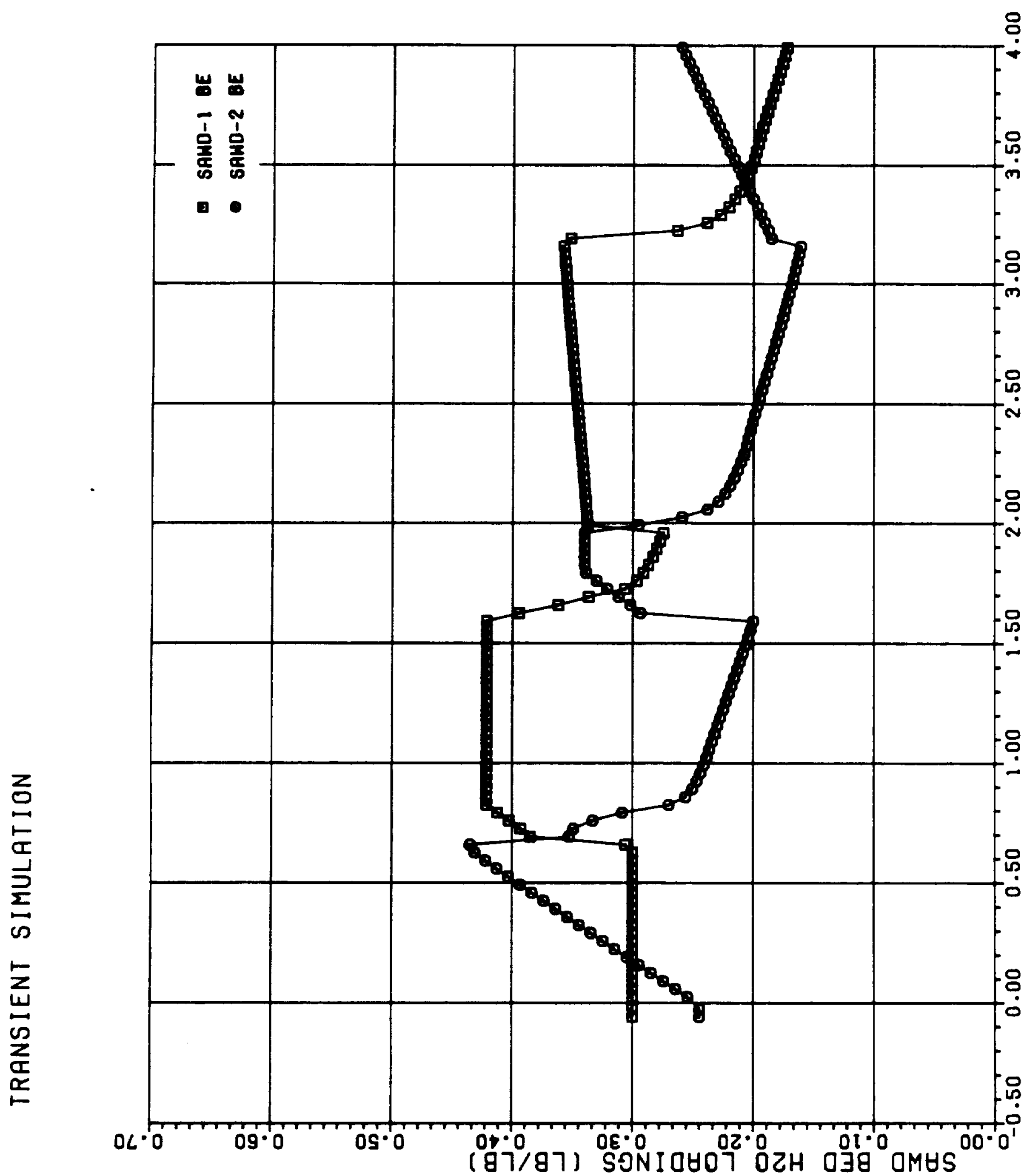

TRANSIENT SIMULATION
NITROGEN MAKEUI
OXYGEN MAKEUP
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
MISSION TIME - HOURS
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
TWO GAS CONTROLLER ADDITIONS (LB/HR)

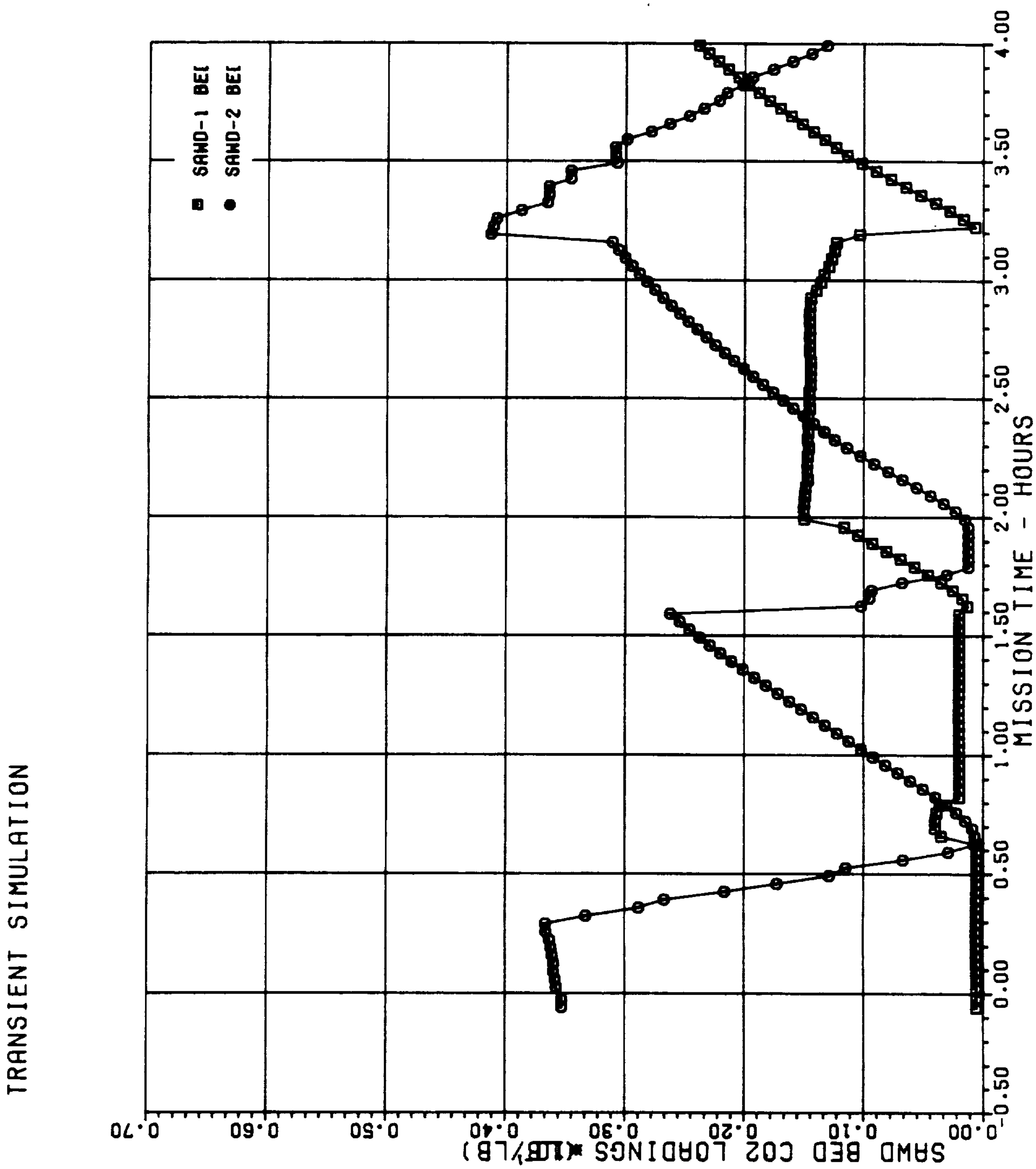

TRANSIENT SIMULATION
DRY BU
DEW PO
MISSION TIME - HOURS
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
CABIN GAS TEMPERATURES (F)
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00


TRANSIENT SIMULATION
CABIN RELATIVE HUMIDITY (DECIMAL)
MISSION TIME - HOURS
0.35
0.40
0.45
0.50
0.55
0.60
0.65
0.70
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00


TRANSIENT SIMULATION
MISSION TIME - HOURS
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
CABIN CO2 PRESSURE (MM HG)
0.00
1.00
2.00
3.00
4.00
5.00
6.00
7.00


TRANSIENT SIMULATION
SAND-1 BED
SAND-2 BED
MISSION TIME - HOURS
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
SAND BED TEMPERATURES (F)
50.00
75.00
100.00
125.00
150.00
175.00
200.00
225.00


TRANSIENT SIMULATION
SAWD-1 BE
SAWD-2 BE
MISSION TIME - HOURS
SAWD BED H2O LOADINGS (LB/LB)
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70


TRANSIENT SIMULATION
SAWD-1 BED
SAWD-2 BED
MISSION TIME - HOURS
SAWD BED CO2 LOADINGS *(LB/LB)
-0.50
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70

APPENDIX B

USER'S MANUAL FOR ECLSB MODEL

An extension of the original ESCM program is to develop lightweight simulation models of various life support equipment and to combine them into a system. Unlike the SAWD emulation model, these simulation models are not detailed and principally simulate the output for a given input. The system modelled consists of one air revitalization group and one waste water management group. The major components in the group are:

Function	Subsystem
CO_2 Removal	Electrochemical Depolarized Concentrator
CO_2 Reduction	Sabatier
O_2 Generation	Static Feed Solid Polymer Electrolysis
Trace Gas Removal	Catalytic Oxidizer
Condensate Processing	Multifiltration
Urine Reclamation	Vapor Compression Distillation

The model is called ECLSB and a complete User's Manual [1] for it has been published.

APPENDIX C

SPACE STATION MODEL

C.1 INTRODUCTION

As part of the extension to the ESCM contract, a model of a potential Space Station Air Revitalization System was put together using the G189A [2] computer program. Unlike the ECLSB model described in Appendix B, this model treats only the ARS and does not treat any of the waste water and condensate storage tanks or processing equipment.

The Space Station model includes a habitat, a laboratory, four connecting nodes, and four air revitalization systems. The G189A input data set and the schematic were architectured to provide the user with a great deal of flexibility to easily swap subsystems of the same function.

The model was also planned to permit growth whereby hyperbaric chamber loads or loads from additional models could easily be added or various bussing schemes can be explored.

Lastly, an additional plotting capability was added where plots of Space Station simulation transients can be reviewed on the IBM 3179G graphic terminals and/or plotted on the Versatec plotter. The software package used to create these plots is CAETMS [3].

C.2 DESCRIPTION OF SYSTEM

The system modelled is presented in Figures C-1 through C-14, and they are arranged in a hierarchical manner. Figure C-1 gives the overview of the entire model where rectangular blocks are used to represent groupings of equipment or a specific physical volume. The numbers in the blocks are the component number or groups of numbers which are used by G189A. The letters "P" and "S" denote primary and secondary flow paths in keeping with the G189A scheme for component flow connections [2].

Figure C-2 presents the fan, mixers, and splitters needed to represent the action of the four nodes on the air stream circulating between the habitat and laboratory modules. The nodes may also receive air from other sources like a hyperbaric chamber.

The ARS equipment for the habitat module and the laboratory module is presented in Figures C-3 and C-4. Again, rectangular blocks are used to represent groups of equipment or components. Accordingly, Figures C-5 and C-6 present the components for the cooling packages in the habitat and laboratory modules respectively. The following identifies the remaining figures.:

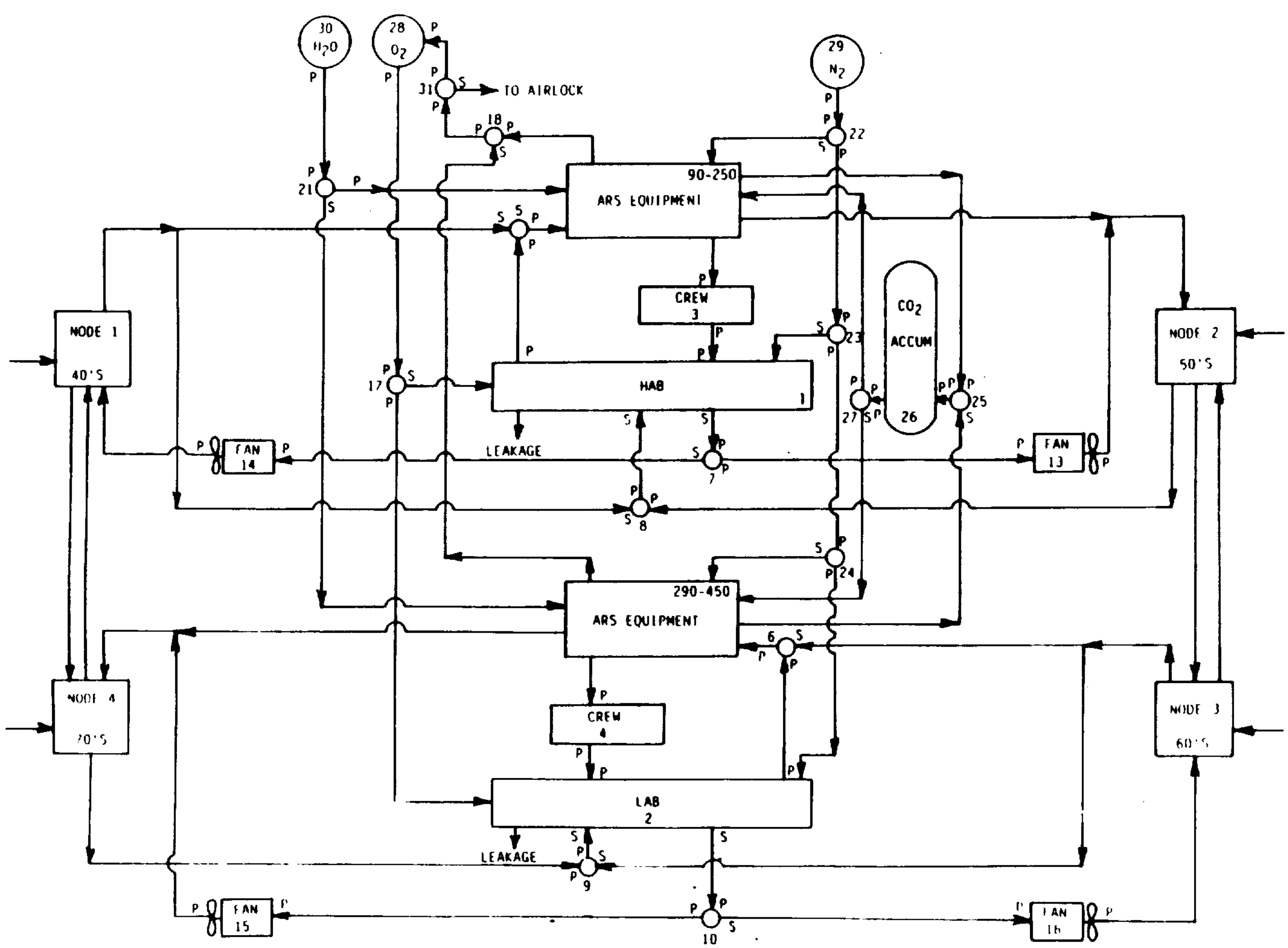


FIGURE C-1
SPACE STATION MODEL OVERVIEW

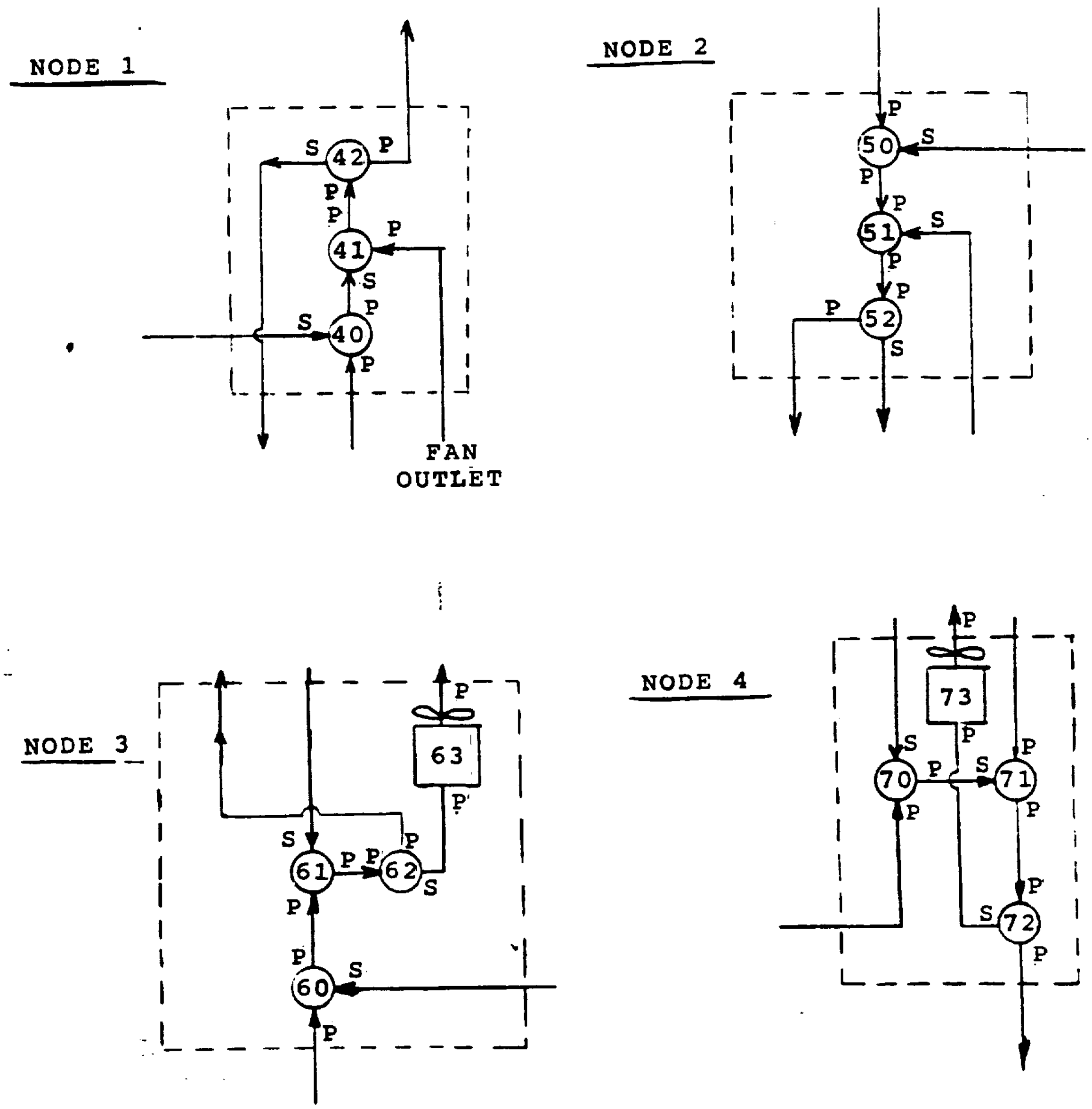


FIGURE C-2
SPACE STATION NODES

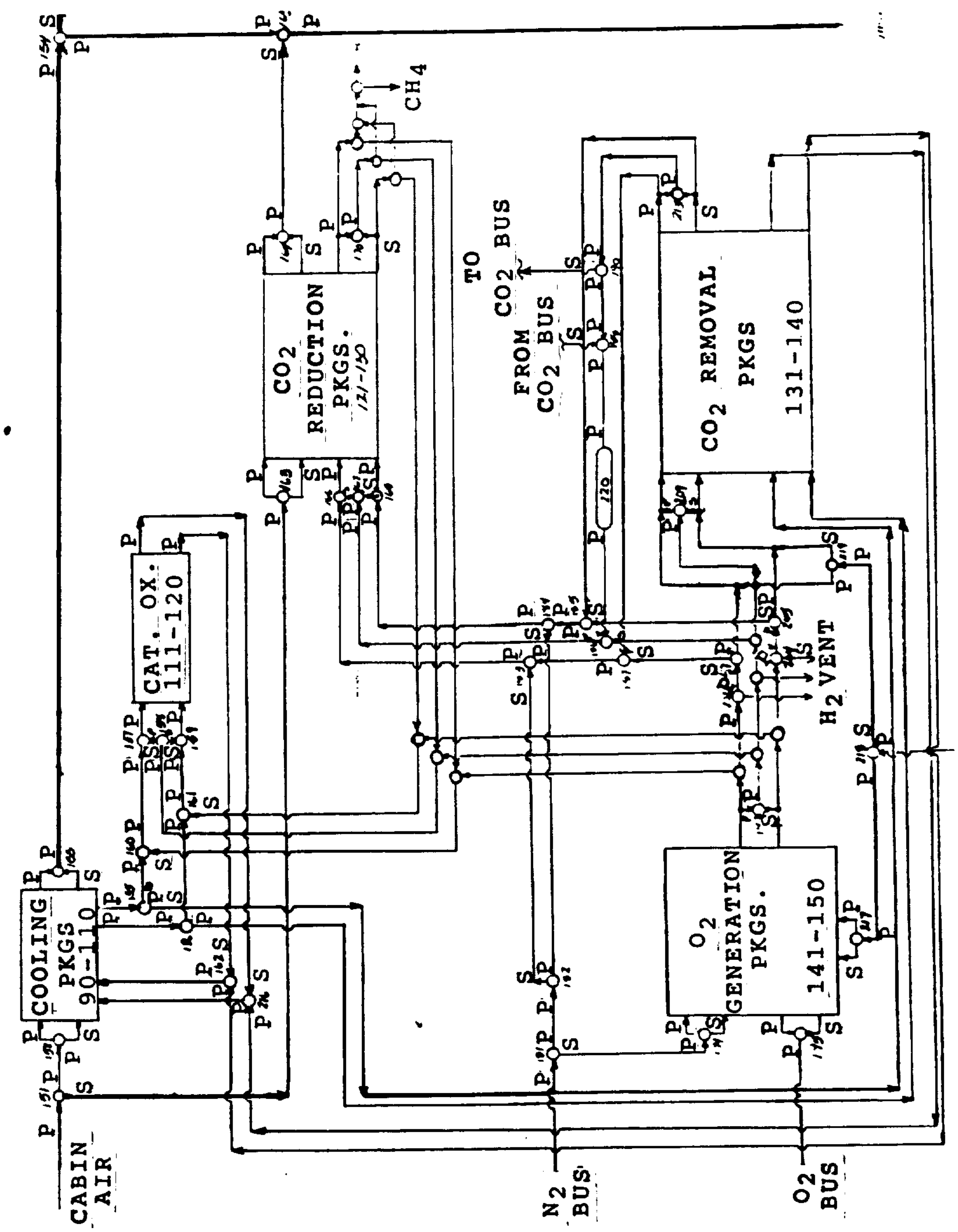


FIGURE C-3
OVERVIEW OF HABITAT ARS

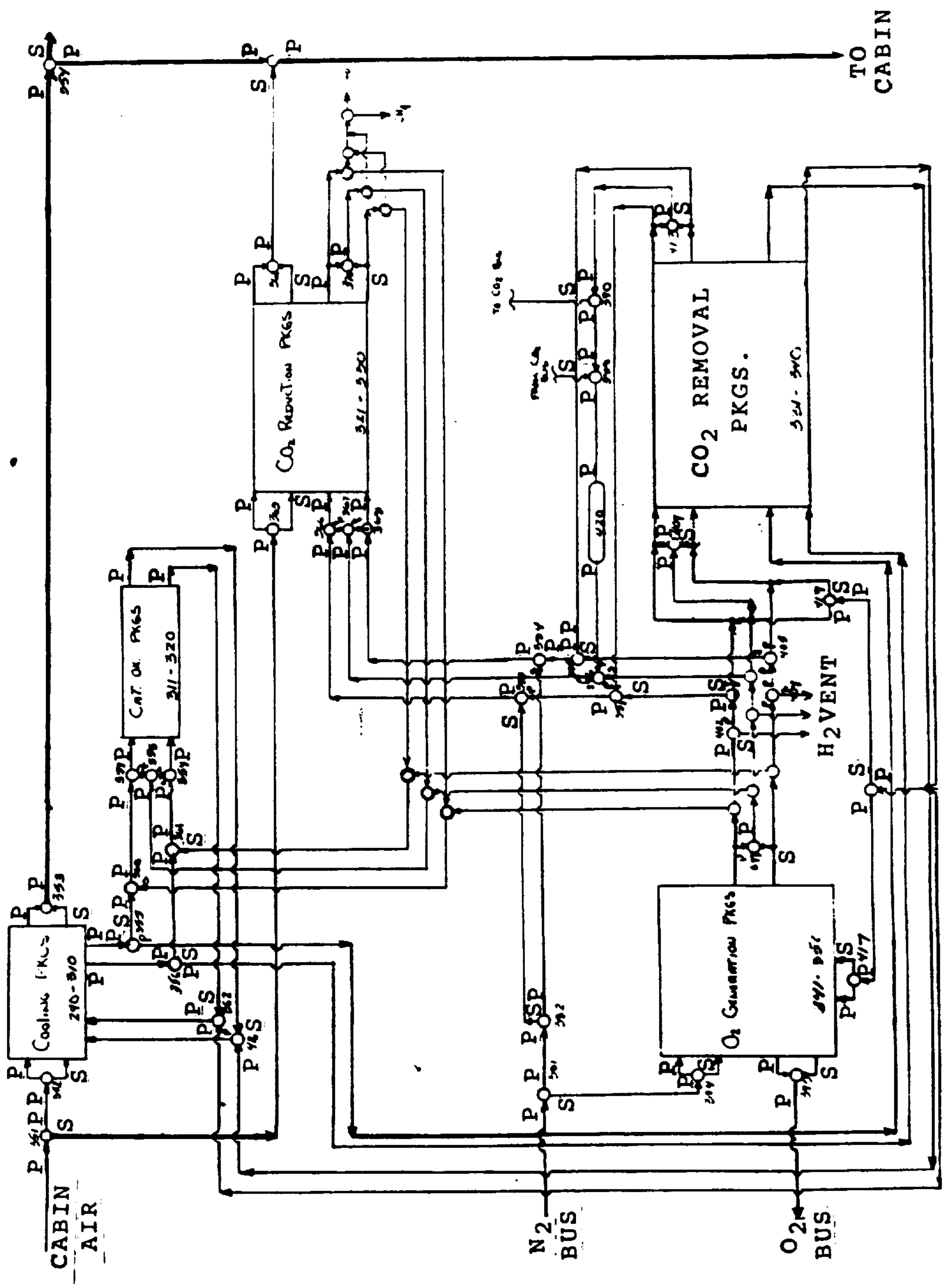


FIGURE C-4
OVERVIEW OF LABORATORY ARS

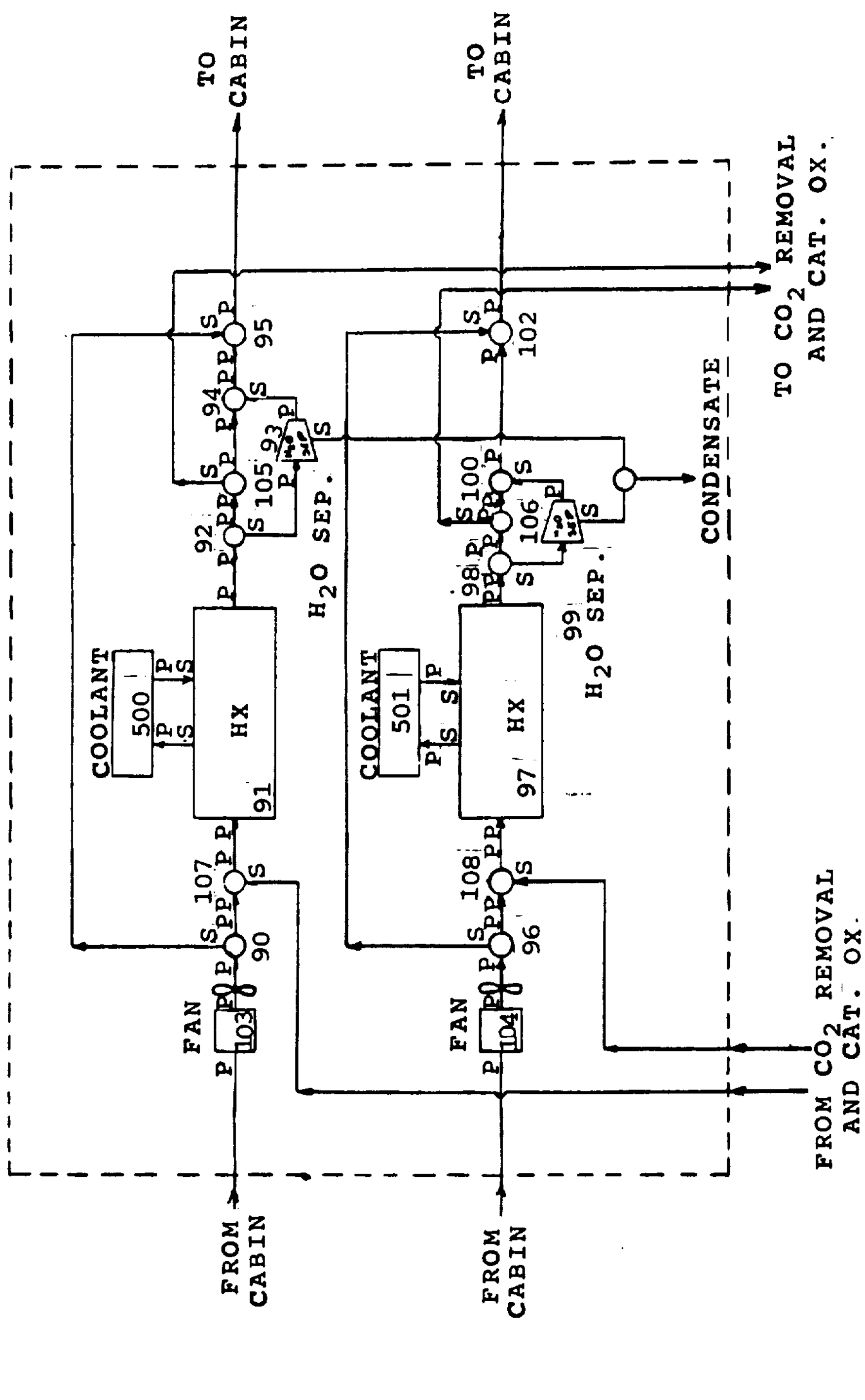


FIGURE C-5
HABITAT COOLING PACKAGES

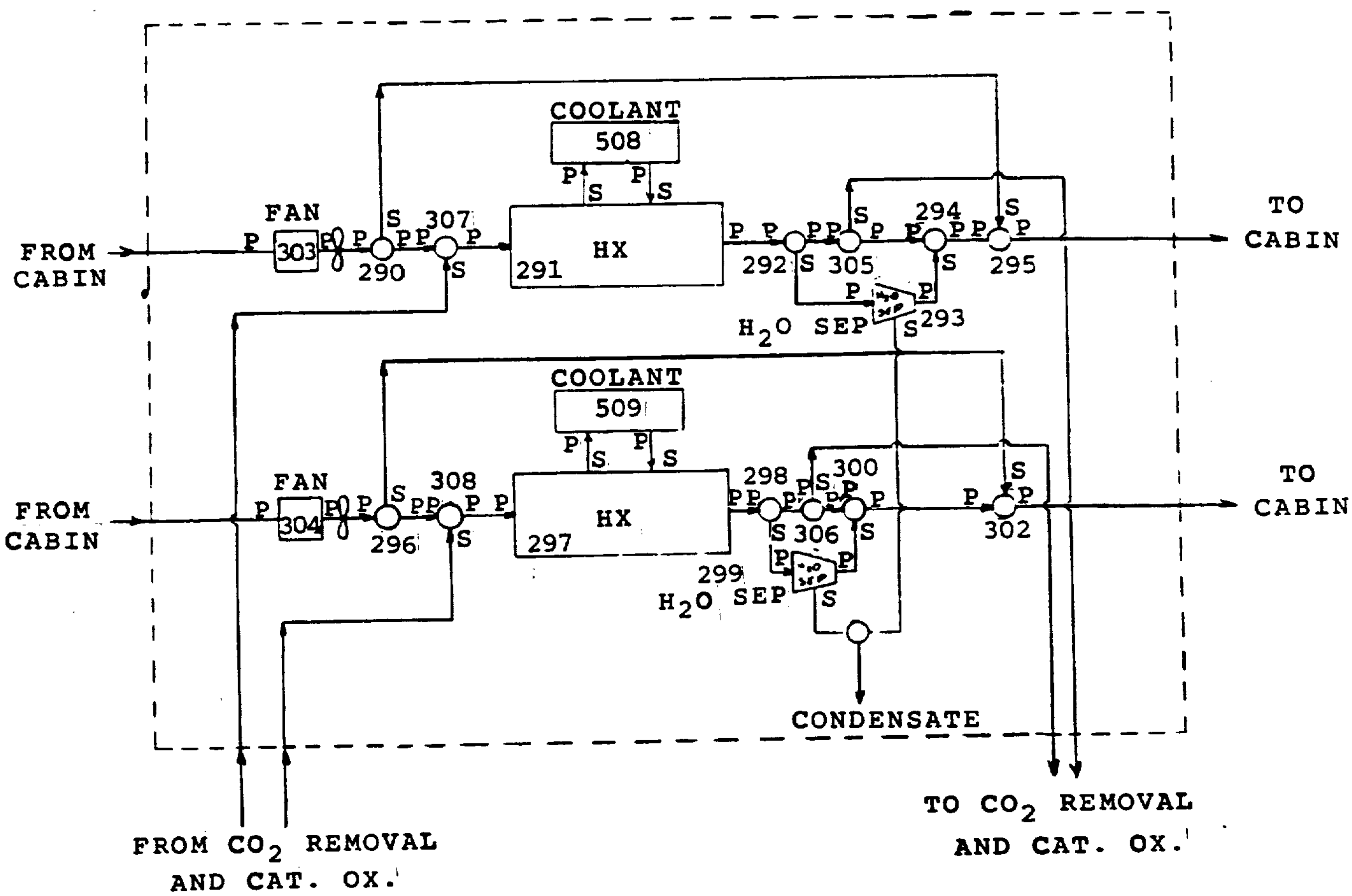


FIGURE C-6
LABORATORY COOLING PACKAGES

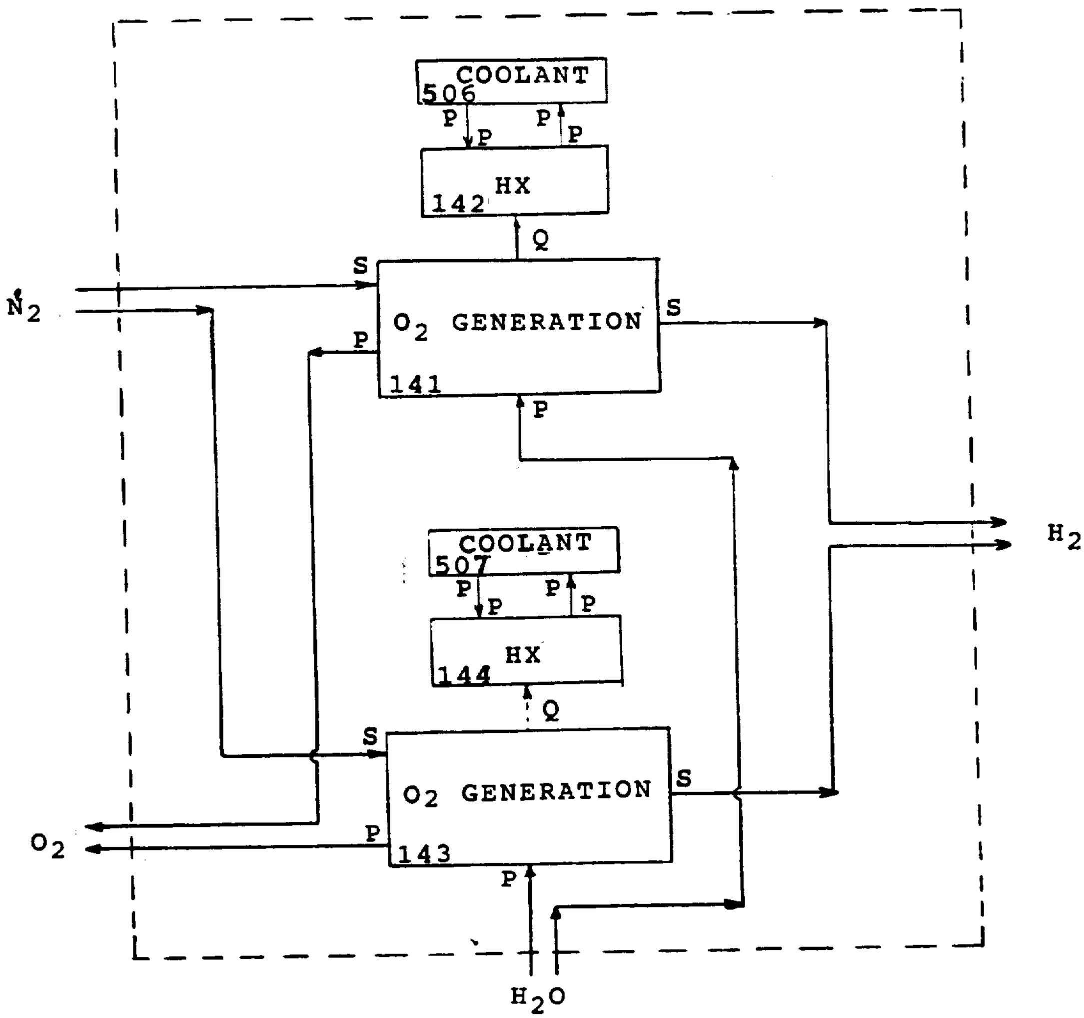


FIGURE C-7
HABITAT OXYGEN GENERATORS

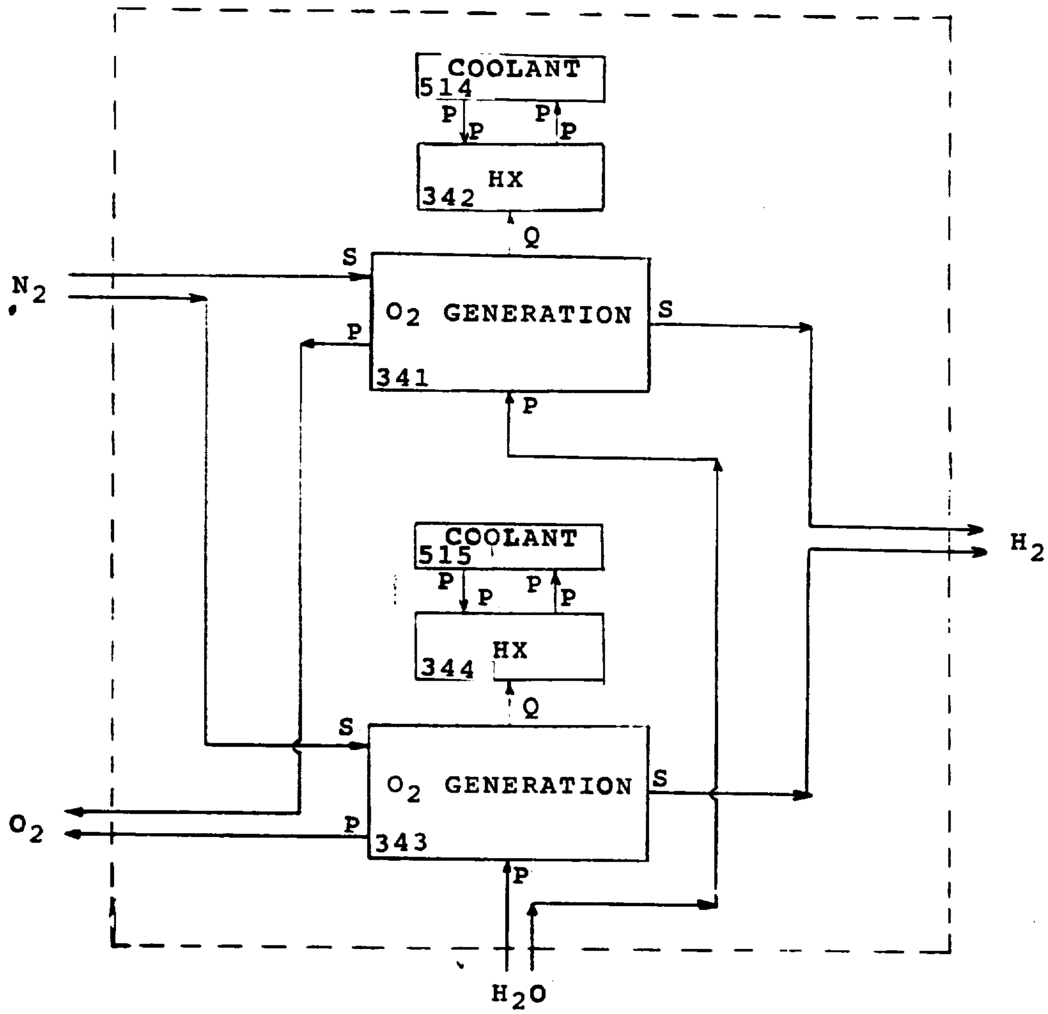


FIGURE C-8
LABORATORY OXYGEN GENERATORS

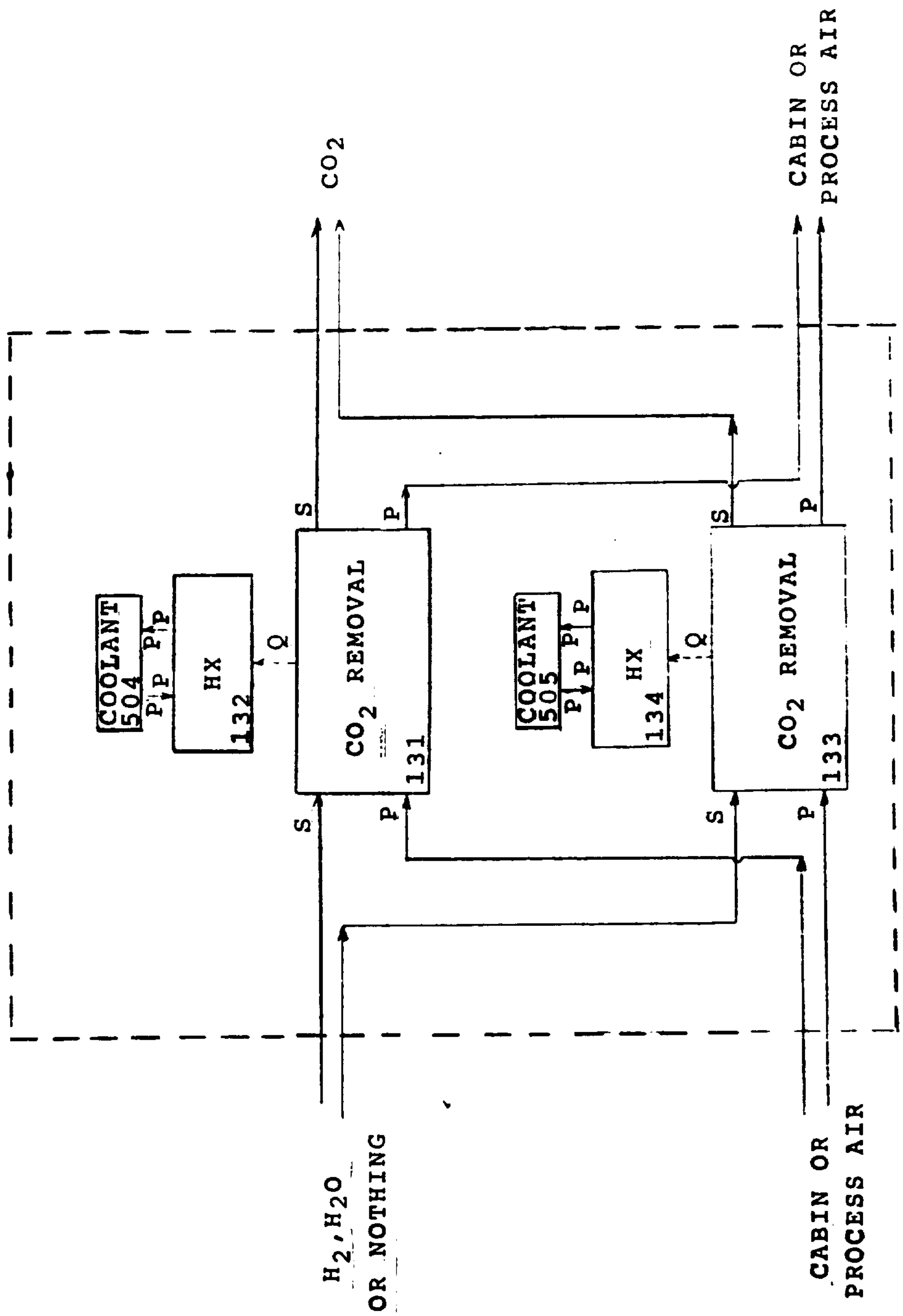


FIGURE C-9
HABITAT CO_2 REMOVAL UNITS

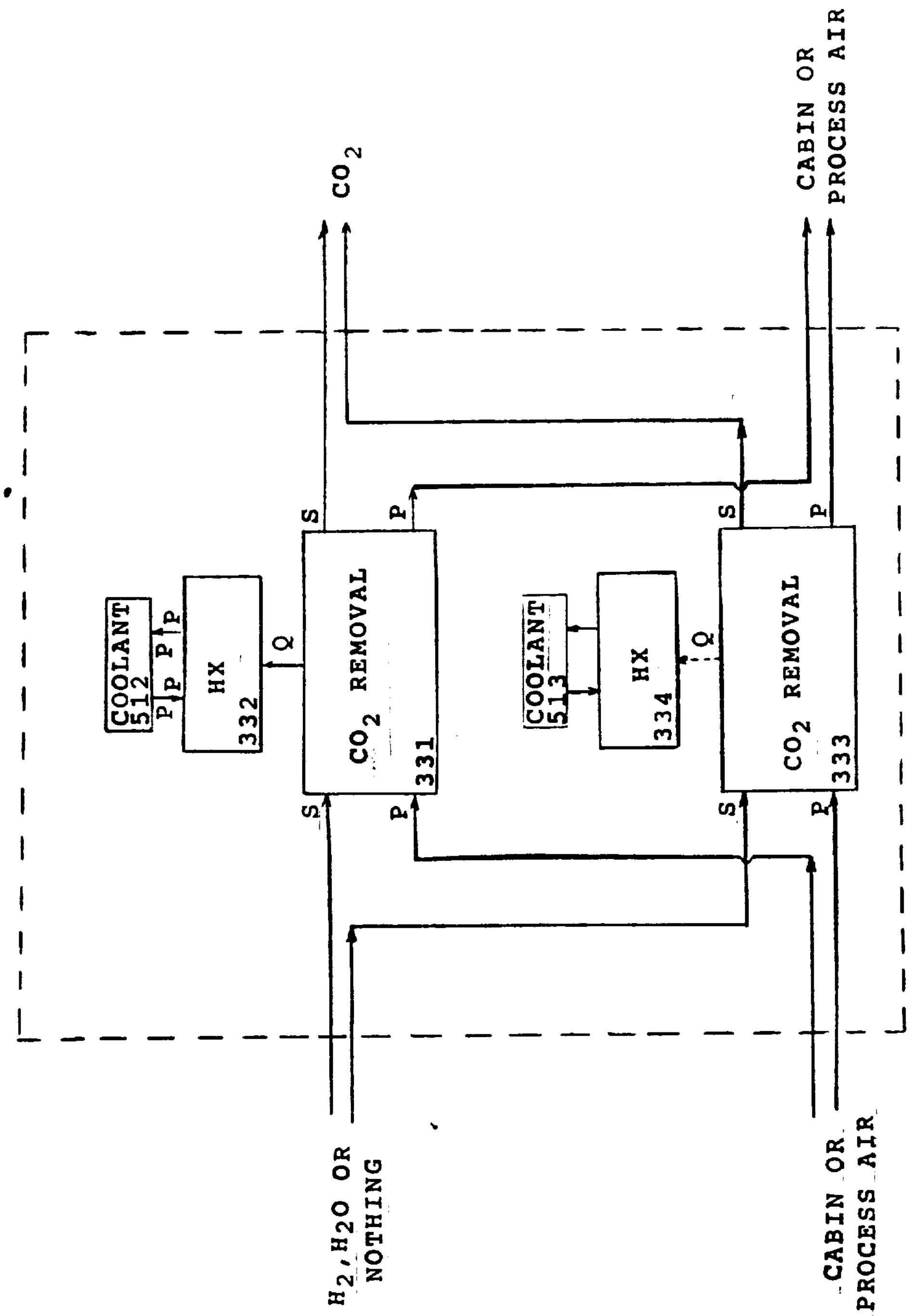


FIGURE C-10
LABORATORY CO_2 REMOVAL UNITS

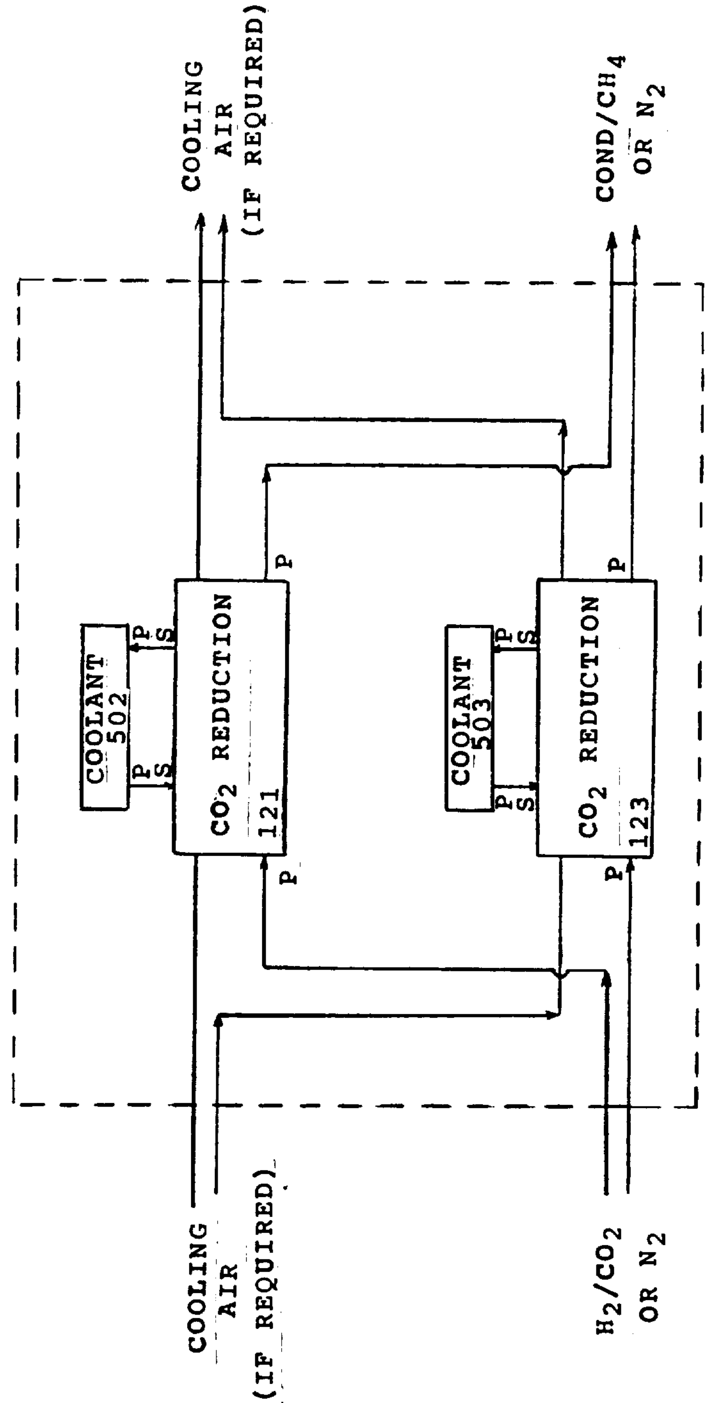


FIGURE C-11
HABITAT CO_2 REDUCTION UNITS

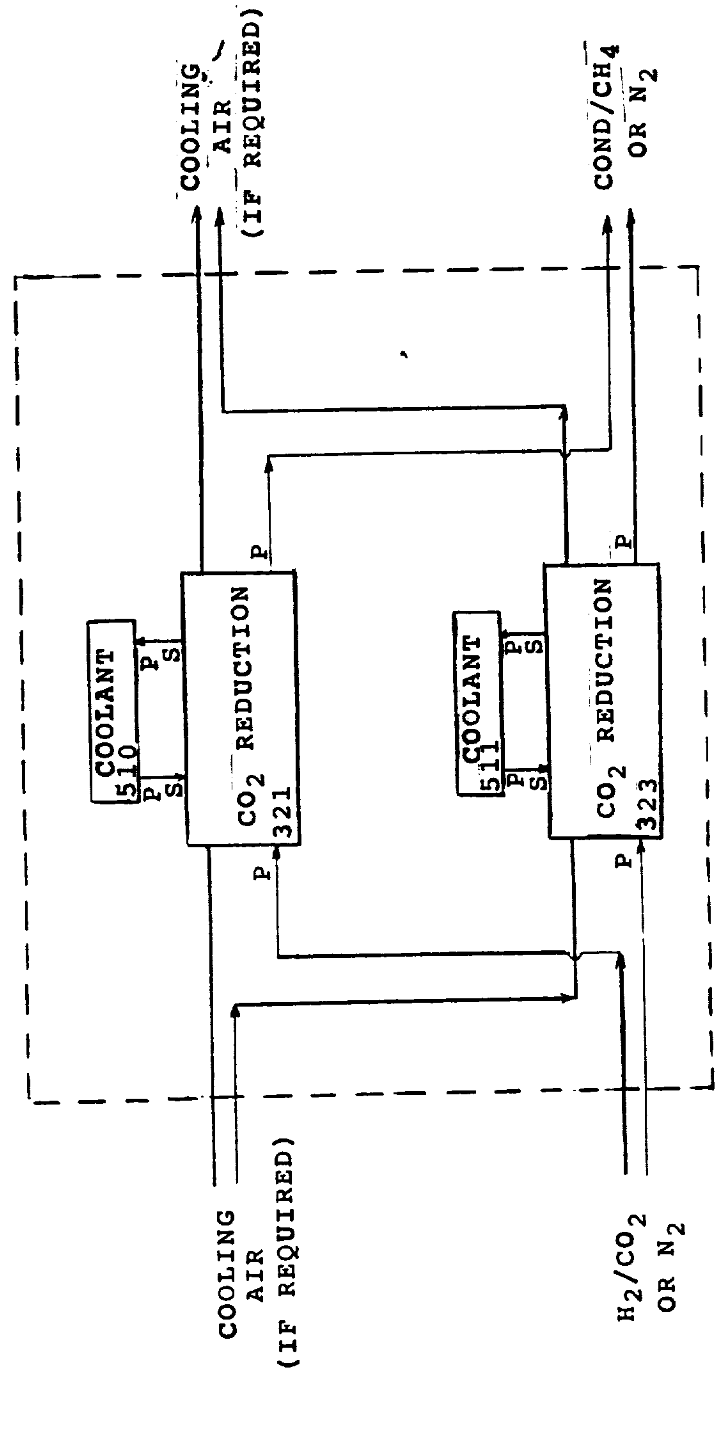


FIGURE C-12
LABORATORY CO_2 REDUCTION UNITS

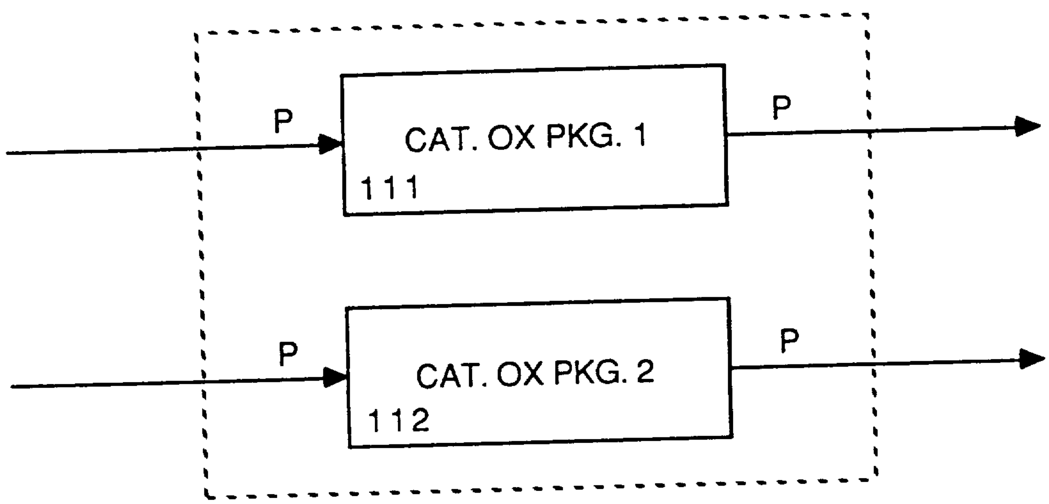


FIGURE C-13
HABITAT CATALYTIC OXYDIZERS

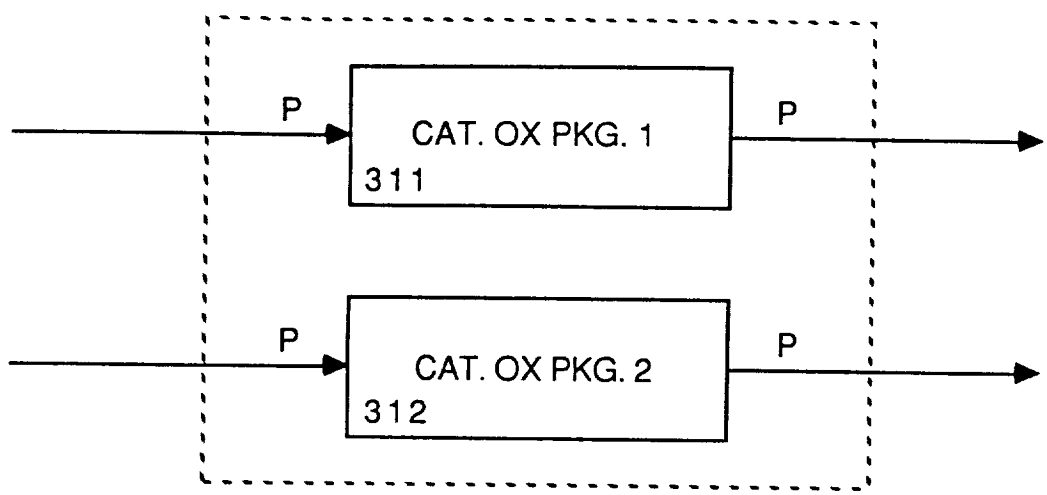


FIGURE C-14
LABORATORY CATALYTIC OXYDIZERS

C.2 DESCRIPTION OF SYSTEM (Continued)

Package	Habitat	Laboratory
Oxygen Generator	C-7	C-8
CO_2 Removal	C-9	C-10
CO_2 Reduction	C-11	C-12
Catalytic Oxidizer	C-13	C-14

The following sections discuss the operation of the system.

C.2.1 Overall Operation

The air stream circulates through both habitats and the four nodes. First, the air leaves the habitat and splits to each of nodes 1 and 2. Inside these nodes, air from the habitat mixes with air from the corresponding laboratory nodes. This mixed air then splits and flows back to the habitat and back to the corresponding laboratory node.

Air is also drawn from the habitat and laboratory modules by ARS equipment. The ARS equipment provides air cooling, humidity removal, CO_2 removal, oxygen generation, and trace gas removal. Any oxygen generated goes into an oxygen bus which contains an oxygen storage tank. Oxygen generation equipment is supplied water from a water supply tank. At present, carbon dioxide removed by

C.2.1 Overall Operation (Continued)

each CO_2 removal unit is stored in each unit's own CO_2 accumulator. The architecture exists for possible CO_2 bussing concepts; however, these concepts have not been explored and validated on the model. In addition, the architecture exists for a nitrogen bus for equipment purging. This architecture can be used at a future date when equipment models are developed further to simulate the effects of nitrogen purging and the need arises to explore these effects.

Air from the equipment is then altered by crew additions of CO_2 and water vapor and by subtraction of oxygen before returning to the habitat and laboratory modules.

C.2.2 ARS Equipment Operation

Figures C-3 and C-4 show the arrangement of ARS equipment packages for the model. As shown in Figures C-5 through C-14, two units are available in each of the packages represented by a rectangle in Figures C-3 and C-4. Therefore, in the habitat, two oxygen generator units exist; and in the laboratory, two oxygen generator units exist. This gives a total of four in the modeled Space Station. The same is true for the condensing heat exchangers, CO_2 removal units, CO_2 reduction units, and the catalytic oxidizer units.

C.2.2 ARS Equipment Operation (Continued)

The model is configured presently to have each group of ARS equipment operate independently of the other; a group of equipment is defined as a condensing heat exchanger, an oxygen generator, a CO_2 removal unit, a CO_2 reduction unit, and a catalytic oxidizer. The architecture of the model is constructed to permit exploration of different plumbing configurations and bussing arrangements at a later date.

Water is drawn into the oxygen generator where oxygen and hydrogen are produced. The oxygen flows to an oxygen bus while the hydrogen flows to a CO_2 reduction unit, and if needed to a CO_2 removal unit. An EDC CO_2 removal unit requires hydrogen for operation, while a SAWD or molecular sieve do not. Air from the cooling package flows through the CO_2 removal package where CO_2 is removed from the air and then sent to mix with hydrogen before entering a CO_2 reduction package. The air now with little CO_2 returns to the cooling package.

The CO_2 and the hydrogen flow to the CO_2 reduction package where the CO_2 is reduced to a solid or gas depending upon the reduction process.

C.2.2 ARS Equipment Operation (Continued)

Air from the cooling package also flows to the catalytic oxidizers where trace gases are burned. The air then returns back to the inlet of the cooling package.

C.3 Description Of Computer Program

A description of G189A is contained in the original User's Manual [1]. The subroutines newly written for this Space Station Model are described here. These new subroutines are:

GPOLY1	=	Control Logic
GPOLY2	=	Control Logic
ARSS	=	Tabular and Graphical Output
CNDHEX	=	Condensing Heat Exchanger
BOSCHS	=	Bosch CO_2 Reduction
MOLSIV	=	Molecular Sieve CO_2 Removal
KOHHS	=	Static Feed Water Vapor Electrolysis O_2 Generation

FORTRAN 77 is used extensively in these newly written routines.

C.3.1 GPOLY1 Subroutine

GPOLY1 simulates the control of functions required for operating the Space Station model. Since FORTRAN 77 is used, the standard construct changes from that described in the original manual. Essentially, the construct divides the subroutine into the various control functions for the equipment. The construct is:

```
IF   ( N .EQ. 3 )  THEN
          .
          .
          .
          .
END IF
```

The following are input once at the first execution of GPOLY1; these are various options to be selected by the user:

KK(80,16) = Process Air Bus? 1 = Yes, 0 = No

KK(80,17) = CO_2 Gas Bus? 0 = None, 1 = Intramod, 2 = Intermod

KK(80,19) = N_2 Gas Bus? 1 = Yes, 0 = No

KK(80,19) = H_2 Gas Bus? 0 = None, 1 = Intramod

KK(80,20) = Habitat O_2 Gen #1 On? 1 = Yes, 0 = No

KK(80,21) = Habitat CO_2 Removal #1 On? 1 = Yes, 0 = No

C.3.1 GPOLY1 Subroutine (Continued)

KK(80,22) = Habitat CO_2 Reduction #1 On? 1 = Yes, 0 = No

KK(80,23) = Habitat Cat. Ox. #1 On? 1 = Yes, 0 = No

KK(80,24) = Habitat O_2 Gen. #2 On? 1 = Yes, 0 = No

KK(80,25) = Habitat CO_2 Removal #2 On? 1 = Yes, 0 = No

KK(80,26) = Habitat CO_2 Reduction #2 On? 1 = Yes, 0 = No

KK(80,27) = Habitat Cat. Ox. #2 On? 1 = Yes, 0 = No

KK(80,28) = Laboratory O_2 Gen. #1 On? 1 = Yes, 0 = No

KK(80,29) = Laboratory CO_2 Removal #1 On? 1 = Yes, 0 = No

KK(80,30) = Laboratory CO_2 Reduction #1 On? 1 = Yes, 0 = No

KK(80,31) = Laboratory Cat. Ox. #1 On? 1 = Yes, 0 = No

KK(80,32) = Laboratory O_2 Gen. #2 On? 1 = Yes, 0 = No

KK(80,33) = Laboratory CO_2 Removal #2 On? 1 = Yes, 0 = No

KK(80,34) = Laboratory CO_2 Reduction #2 On? 1 = Yes, 0 = No

KK(80,35) = Laboratory Cat. Ox. #2 On? 1 = Yes, 0 = No

These are then used to set up the proper solution path, the fluid flow fractions for splitters, and to make any adjustments in component to component flow connections.

C.3.1 GPOLY1 Subroutine (Continued)

Printoff frequency, habitat and laboratory air conditions, and fan flows are input once at the first execution:

VV(80,55) = Printoff frequency, time steps per printoff

VV(80,66) = Habitat gas mixture initial temperature, $^{\circ}F$

VV(80,67) = Habitat total pressure, pin

VV(80,68) = Habitat CO_2 partial pressure, mm Hg

VV(80,69) = Habitat dew point temperature, $^{\circ}F$

VV(80,70) = Habitat O_2 partial pressure, psia

VV(80,71) = Laboratory gas mixture initial temperature, $^{\circ}F$

VV(80,72) = Laboratory total pressure, psia

VV(80,73) = Laboratory CO_2 partial pressure, mm Hg

VV(80,74) = Laboratory dew point temperature, $^{\circ}F$

VV(80,75) = Laboratory O_2 partial pressure, psia

VV(13,76) = Nodal mixer fan flow, cfm

VV(103,76) = Cooling package fan flow, cfm

After all these values are input and various initializations done, total pressure and oxygen partial pressure control laws are executed for the habitat and the laboratory. The following are input and output from the habitat (component number 1):

C.3.1 GPOLY1 Subroutine (Continued)

Input

R(4) = Habitat total pressure, psia

R(94) = Present oxygen partial pressure, psia

Output

R(165) = Oxygen flow required into habitat, lbm/hr

R(166) = Nitrogen flow required into habitat, lbm/hr

The analogous variables are used for the component number 2 laboratory.

Following oxygen partial pressure and total pressure control is the calculation of crew metabolic loads. The following are input and output from the crew represented as component number 3:

Input

TIME = Elapsed time of simulation, sec.

VV(1,104) = Habitat temperature, $^{\circ}F$

C.3.1 GPOLY1 Subroutine (Continued)

Output

R(66) = Sensible load per man, Btu/Hr

R(67) = Latent heat load generated per man, Btu/Hr

R(82) = Total metabolic heat generated per man, Btu/Hr

The analogous variables are used for the other crew which is represented by component number 4.

Control of oxygen generation units is performed next. The four units are represented as components 141, 143, 341, and 343. The first two components are in the habitat while the three hundred series components are in the laboratory. The following are input and output from the oxygen generation control logic represented by component number 141.

Input

GENH1 = Habitat O_2 Gen. #1 On? 1 = Yes, 0 = No

R(72) = Nominal design SPE electrolysis current, amps

VV(28,72) = Pressure in the oxygen bus accumulator, psia

Output

R(69) = Actual current applied to SPE unit, amps

C.3.1 GPOLY1 Subroutine (Continued)

The condensing heat exchangers in the cooling package are followed by water separators. To model the action of the separator in its removal of entrained liquid water, GPOLY logic is employed. The following are input and output for the water separator components represented by components 93, 99, 293 and 299:

Input

A(7) = Entrained liquid entering water separator, lbm/hr

DTIME = Simulation time step, seconds

R(68) = Cumulative water removed by separator, lbm

A(1) = Total mass flow into separator, lbm/hr

A(5) = Total dry mass flow into separator, lbm/hr

A(6) = Specific heat at dry mass, flow into separator, Btu/lbm-F

CPCONV = Specific heat of water vapor, Btu/lbm-F

Output

A(7) = New entrained liquid entering water separator, lbm-hr

A(1) = New total flow entering separator, lbm/hr

CPA = New specific heat of flow entering separator, Btu/lbm-F

R(67) = Flow of liquid water leaving separator, lbm/hr

R(68) = New cumulative water removed by separator, lbm

C.3.1 GPOLY1 Subroutine (Continued)

Temperature of the habitat and laboratory is effected by regulating the bypass flow of air around the condensing heat exchangers. The following are input and output for the component number 90 splitter upstream of the component number 91 condensing heat exchanger:

Input

VV(1,104) = Habitat temperature, $^{\circ}F$

VV(1,87) = Habitat setpoint temperature, $^{\circ}F$

DTIME = Simulation time step, seconds

Output

R(65) = fraction of flow bypassing the heat exchanger

Following some mass balance updates for G189A is a calculation of the water flow consumed by electrolysis and the flow split of water to be divided between the habitat and laboratory oxygen generator units. The following are input and output:

C.3.1 GPOLY1 Subroutine (Continued)

Input

VV(141,67) = Habitat SPE unit #1 water demand, pph

VV(143,67) = Habitat SPE unit #2 water demand, pph

VV(341,67) = Laboratory SPE unit #1 water demand, pph

VV(343,67) = Laboratory SPE unit #2 water demand, pph

DTIME = Simulation time step, seconds

VV(30,67) = Water consumed by SPEs to date, lbm

Output

VV(30,67) = New water consumed by SPEs, lbm

Next, the control of CO_2 out of the accumulator to feed the CO_2 reduction unit is done. The amount of flow is updated every molecular sieve cycle.

Input

VV(135,72) = Pressure in accumulator tank, psia

VV(1,104) = Habitat temperature, ^oF

VV(131,65) = Molecular sieve half cycle time, minute

TIME = Elapsed time of simulation, seconds

VV(131,87) = CO_2 removal rate by molecular sieve, pph

DTIME = Simulation time step, seconds

C.3.1 GPOLY1 Subroutine (Continued)

Output

R(1) = Flow out of accumulator, pph

Analogous variables are used for the other CO_2 accumulators and removal units.

Hydrogen vent control is accomplished by the use of flow splitter components 202 and 204 for the habitat and 402 and 404 for the laboratory. The following are the input and output:

Input

VV(135,72) = Habitat CO_2 removal unit #1 accumulator pressure, psia
RATE1 = Flow out of accumulator to reduction unit, lbm/hr
A(1) = Flow into splitter, lbm/hr

Output

R(65) = Fraction of input H_2 flow to be vented

Lastly, the flow out of the oxygen accumulator component 28 and the flow of oxygen to the habitat and laboratory are computed. For the component 28 oxygen accumulator.

C.3.1 GPOLY1 Subroutine (Continued)

Input

VV(1,104) = Habitat temperature, F

VV(1,165) = Oxygen addition rate required by habitat, lbm/hr

VV(2,165) = Oxygen addition rate required by laboratory, lbm/hr

Output

R(70) = Temperature of oxygen in tank, F

R(1) = Flow out of oxygen tank, lbm/hr

The flow split to the habitat and laboratory is represented by component 17:

Input

VV(1,165) = Oxygen addition rate required by habitat, lbm/hr

VV(2,165) = Oxygen addition rate required by laboratory, lbm/hr

Output

R(65) = Function of inlet flow to laboratory.

C.3.2 GPOLY2 Subroutine

GPOLY2 computes the mass additions to the habitat that arise from components in the primary and secondary flow streams. These additions are then input into the habitat through the R array. This is done because of the manner in which the out flow is computed for the habitat in G189A [2]. Essentially, the exit flow is set equal to the inlet flow. The mass changes only due to mass additions. The following are input and output for the component number 3 crew who are in the habitat.

Input

R(70)	=	Water added by crew, lbm/hr
W(131,88)	=	Water removal rate of Co2 removal unit #1 in habitat, lbm/hr
W(133,88)	=	Water removal rate of Co2 removal unit #2 in habitat, lbm/hr
W(93,67)	=	Water removed by unit #1 condensing Hx, lbm/hr
W(99,67)	=	Water removed by unit #2 condensing Hx, lbm/hr
W(1,25)	=	Water leaving habitat to nodes, lbm/hr
W(8,6)	=	Water returning to habitat from nodes, lbm/hr
R(68)	=	Oxygen removed by crew, lbm/hr

C.3.2 GPOLY2 Subroutine (Continued)

W(1,29) = Oxygen leaving habitat to nodes, lbm/hr

W(8,10) = Oxygen returning to habitat from nodes, lbm/hr

R(69) = CO_2 generated by crew lbm/hr

W(133,87) = CO_2 removed by molecular sieve unit #2, lbm/hr

W(1,31) = CO_2 leaving habitat to nodes, lbm/hr

W(8,12) = CO_2 returning to habitat from nodes, lbm/hr

Output

W(1,137) = Water addition rate to habitat, lbm/hr

W(1,175) = Oxygen addition rate to habitat, lbm/hr

W(1,177) = CO_2 addition rate to habitat, lbm/hr

Analogous variables are used for the laboratory module.

C.3.3 ARSS Subroutine

ARSS is the subroutine which prints the output of the Space Station model and which generates a plot file for use by CAETMS [3] for generation of plots. As no significant calculations are performed in ARSS, the input and output variables are virtually identical. A complete description of the output is presented in Section C.4.

C.3.4 Component Subroutines

Models were generated for the following components:

KOHHS = Static feed water vapor electrolysis (KOH)

MOLSIV = Molecular sieve CO_2 removal

BOSCHS = Bosch CO_2 reduction

CNDHEX = Condensing heat exchanger

Tables C-1 through C-4 contain a listing of these programs and provide their documentation as well as a listing of their input and output.

TABLE C-1

LISTING OF KOHHS

```
      SUBROUTINE KOHHS
C
C     THIS SUBROUTINE MODELS A KOH ELECTROLYSIS MODULE MADE UP
C     OF A NUMBER OF CELLS. FEEDWATER IS CONVERTED INTO HYDROGEN
C     AND OXYGEN. PRODUCTION DEPENDS ON ELECTRICAL CURRENT APPLIED,
C     EFFECTIVE AREA PER CELL, NUMBER OF CELLS, AND EFFICIENCIES.
C     THE UNIT MAY BE COOLED BY GAS OR LIQUID FLOW.
C
C     INPUTS:
C
C     K(16) - TABLE NUMBER FOR CELL OVERALL EFFICIENCY
C     K(17) - ALTCOM NUMBER FOR LIQUID COOLING
C     K(18) - TABLE NUMBER FOR UA TO ALTCOM
C     R(52) - EFFECTIVE SUMMED CONDUCTANCE (BTU/HR-F)
C     R(54) - AMBIENT GAS TEMPERATURE (F)
C     R(55) - AMBIENT GAS TO INSULATION UA (BTU/HR-F)
C     R(57) - AMBIENT WALL TEMPERATURE (F)
C     R(58) - AMBIENT WALL TO INSULATION SURFACE FA (1/SQ.FT.)
C     R(60) - STRUCTURE TEMPERATURE (F)
C     R(61) - CELL TO STRUCTURE UA (BTU/HR-F)
C     R(64) - INSULATION SURFACE TO CELL UA (BTU/HR-F)
C     R(66) - CELL POWER EFFICIENCY (%), IF CONSTANT
C     R(67) - VALUE OF 1ST INDEP. VARIABLE FOR EFFICIENCY INTERPOL.
C     R(68) - VALUE OF 2ND INDEP. VARIABLE FOR EFFICIENCY INTERPOL.
C     R(69) - CURRENT (AMPS)
C     R(70) - DELIVERY PRESSURE (PSIA)
C     R(71) - CELL TEMPERATURE (F), FIRST GUESS
C     R(73) - KOH CONCENTRATION (WEIGHT %)
C     R(74) - UA BETWEEN CELL AND LIQUID COOLANT (BTU/HR-F)
C     R(75) - VALUE OF 1ST INDEP. VARIABLE FOR UA INTERPOL.
C     R(76) - VALUE OF 2ND INDEP. VARIABLE FOR UA INTERPOL.
C     R(81) - TRIAL AND ERROR CONVERGENCE TOLERANCE (%)
C     R(82) - PRODUCT OXYGEN RELATIVE HUMIDITY (%)
C     R(83) - PRODUCT HYDROGEN RELATIVE HUMIDITY (%)
C     R(84) - UNIT LUMPED THERMAL CAPACITANCE (BTU/F)
C     R(85) - COMPONENT INTIAL TEMPERATURE (F)
C     R(87) - EFFECTIVE AREA PER CELL (SQ. FT.)
C     R(89) - NUMBER OF CELLS
C
C     OUTPUTS:
C
C     R(10) - PRODUCT OXYGEN (LB/HR)
C     R(33) - PRODUCT HYDROGEN (LB/HR)
C     R(51) - CELL TEMPERATURE (F)
C     R(53) - COMPONENT TOTAL HEAT LOSS (EXCL. LOSS TO ALTCOM) (BTU/HR)
C     R(56) - HEAT LOSS TO AMBIENT GAS BY CONVECTION (BTU/HR)
C     R(59) - HEAT LOSS TO AMBIENT WALL BY RADIATION (BTU/HR)
C     R(62) - HEAT LOSS TO STRUCTURE BY CONDUCTION (BTU/HR)
C     R(63) - INSULATION SURFACE TEMPERATURE (F)
C     R(65) - TOTAL HEAT LOSS (SURROUNDINGS + HX) (BTU/HR)
```

TABLE C-1 (CONTINUED)

LISTING OF KOHHS

```
C      R(71) - CELL TEMPERATURE (F)
C      R(72) - ELECTROLYSIS RATE (LB H20 / HR)
C      R(77) - FEEDWATER DISSOLVED MATTER ACCUMULATION RATE (LB/HR)
C      R(78) - TOTAL WATER INFLOW RATE REQUIRED (LB/HR)
C      R(79) - PREVIOUS TRIAL VALUE FOR PHI (BTU/HR)
C      R(80) - PREVIOUS TRIAL VALUE FOR TCELL (F)
C      R(86) - ACCUMULATED DISSOLVED MATERIAL (LB)
C      R(88) - CURRENT DENSITY (ASF)
C      R(90) - VOLTAGE (VOLTS)
C      R(91) - EFFICIENCY (%)
C      R(92) - INPUT POWER REQUIRED (BTU/HR)
C
C
C
       COMMON  /COMP/ DS(15),N,NA1,NB1,NC,NCAB,NCFL,NEXT,NEXV,NK,
      1  NKEX,NKS,NKT,NLFL,NP,NPASS,NPF,NPFT(6),NQ,NS,NSF,NSFT(6),
      2  NSTR(18),NSUBR,NV,NVT,Y(12)
       COMMON  /RARRAY/  IMAXR,R(92)
       COMMON  /ECLST1/  KCHOUT,KPRNT,KPTINV(4),KWIT,KWIT1,KWIT2,
      1  KWIT3,KWIT4,NUFF,KSTEDY
       COMMON  /KANDV/ K
       COMMON  /MISC/  DTIME,GRAV,KFLSYS,KOUTPT,KPDROP,KSYPAS,KTRANS,
      1  LPSUM(5),MAXCI,MAXLP,MAXSLP,MAXSSI,NCOMPS,NEWDT,NLAST,NPASPD,
      2  MINSSI,PCMIN,PLMIN,START,STEADY,TIME,TIMEMX,TMAX,TMIN,WTMAX
       COMMON  /SOURCE/  A(19),B(19),CPA,CPB,IA1,IB1,NA,NB,NPFS,NPFST(6),
      1  NSFS,NSFST(6),RHOA,RHOB,VISCA,VISCB,WTMA,WTMB,XKA,XKB
       EQUIVALENCE (V(1),K(1))
       DIMENSION V(1),K(1)
       DIMENSION   AX(19),NPFSTX(6)
       REAL  MH2,MH200,MO2,MH2OI,NCELLS
       LOGICAL  STEADY, TRANS , CNVRGE
       DATA J /0/
C
C          ARITHMETIC STATEMENT FUNCTION
C
       QFUNC(AA,BB,CC,TC)=(AA*(TC-298.3333)+BB*(TC**2-89002.7778)/2.E+3
      1+CC*(TC**3-26552495.87)/3.E+6)*1.8
       NTEFF =  K(NKS + 1)
       NALT  =  K(NKS + 2)
       NTHC  =  K(NKS + 3)
       EFF    = R(66)
       TCELL  = R(71)
       PHI    = R(79)
       TL     = R(80)
       NCELLS = R(89)
       QT   = 0.0
       CNVRGE = .TRUE.
       TRANS =  ( .NOT. STEADY .AND. NSTR(16).EQ.0 )
       NCFL  =  0
       IF( KTRANS.EQ.1 .AND. TIME.EQ.START .AND. STEADY ) R(86)  = 0.0
```

TABLE C-1 (CONTINUED)

LISTING OF KOHHS

```
C
C        ELECTROLYSIS RATE
      TC  - 0.0
      R(88) - R(69) / R(87)
      R(72) - NCELLS * ( R(69)/ 1850.0 )
      MH2  -  R(72)/ 18.0
      MO2  -   MH2 /  2.0
      PHI - 0.0
C
C              START  TRIAL  AND  ERROR   HEAT BALANCE
C                     INTIAL GUESS FOR TEMP
      TCELL  -  R(71)
      IF ( TCELL .EQ.0.0  )   TCELL  - 120.0
C
         DO 8500 KO  -  1,100
         IF( TRANS ) QT - R(84)*(TCELL - R(85)) * 3600.0 / DTIME
C
C                 FRACTION  DISSOLVED SOLIDS
C
         IF( A(1) .LE. 0.0) THEN
              FRAC - 0.0
         ELSE
              FRAC  -  (A(16)+A(17)+A(18) + A(19))/ A(1)
         END IF
         WATRIN   -    A(1) * (1.0 - FRAC)
C
C                 MOLAR WATER RATES
C
         IF ( R(73) .LT.0.0101 ) THEN
              PS -  PSAT(TCELL)
         ELSE
            IF ( (TCELL-140.)/(TCELL+459.69) .GT. 10.) THEN
              PS -  -10000.
            ELSE
              PS -  0.01984 * (57.48 + 26.18 *
     1                (( TCELL - 140.0)/ (TCELL + 459.69) ) -  R(73) )
     2               /  (0.3074 * 2.777 ** (-17.66 *
     3                (( TCELL - 140.0)/ (TCELL + 459.69) )   ) )
            END IF
         END IF
C
         MH2OO -   MO2 /(((100.0 * R(70)/ PS)/ R(82))  - 1.0 )
     1        +    MH2 /(((100.0 * R(70)/ PS)/ R(83))  - 1.0 )
         MH2OI  -  MH2OO + MH2
         QSIGR  -  MH2OI *(18.0 *  (A(2)  - 77.0) - 68.3 * 1800.0 )
         TC     -  (TCELL +459.69  ) / 1.8
         QSIGP  - MH2* QFUNC(6.947,-0.2,0.481,TC)  + MO2*QFUNC(6.148,
     1             8.10,-0.928,TC) + MH2OO*(QFUNC(7.256,2.30,0.288,TC)
     2             - 57.8 *1800.0 )
         CALL QSURR
```

TABLE C-1 (CONTINUED)

LISTING OF KOHHS

```
C
C            HEAT LOSS TO LIQUID COOLANT
C
      QLOSS  = 0.0
      IF ( NALT .NE. 0 ) THEN
         CALL FLOARY (AX, NALT ,0,NPFSX,NPFSTX ,NAX1)
         CALL PROP( AX,NPFSX,NPFSTX,CPC,WTMX,RHOX,VISCX,XKX )
C
C                FIND  UA
C
         IF( NSTR(2) .NE. 0  .AND.  NSTR(2) .NE. 2 ) THEN
            R(75)  =  AX(1)
            R(76)  =  AX(2)
         END IF
         IF( NSTR(2) .NE. 0 )  THEN
             R(74) = VALUE( NTHC, R(75), R(78) )
         END IF
         IF( AX(1).GT. 0.0 ) THEN
               BETA = R(74) / (AX(1)*CPC)
         ELSE
               BETA = 0.0
         END IF
         IF (BETA.GT.10.) THEN
               TOUT = TCELL
         ELSE
               TOUT =  TCELL + ( AX(2) - TCELL) * EXP(-BETA)
         END IF
         QLOSS  =  AX(1)* CPC * ( TOUT - AX(2) )
         NAX =  LV  (  NALT,65)
         V(NAX)  = QLOSS
         V(NAX +1) =  TOUT
      END IF
      QLOSS =    QLOSS  + R(53)
C
C                FIND   CELL EFFICIENCY
C
      IF( NSTR(1) .NE. 0  .AND.  NSTR(1) .NE. 2 ) THEN
          R(67)  =  TCELL
      END IF
      IF ( NSTR(1) .NE. 0 )  THEN
          EFF = VALUE ( NTEFF, R(67), R(68) )
      END IF
      VOLTS1 = VALUE ( 1, TCELL, 0.0 )
      IF(TCELL.LT.110.) VOLTS1 = 1.70
      DVDA   = VALUE ( 2, R(88), 0.0 )
      VOLTS  = VOLTS1 + DVDA * ( R(88) - 150. )
      EFF    = 1.48 / VOLTS * 100.
      IF( EFF .GT. 99.) EFF = 99.
C
C                 ELECTRICAL POWER
```

TABLE C-1 (CONTINUED)

LISTING OF KOHHS

```
C
          P =    NCELLS * ( 1.48 * R(69) *841.3 / EFF )
C
C                      SUM OF HEAT EFFECTS
C
          PHI    =  - QT  + QSICR - QSIGP - QLOSS  + P
C
C                   FIND  ZERO VALUE OF PHI AS FCN OF TCELL
C
          IF(ABS ( PHI/( P )) .LE.  R(81) /100.0 ) GO TO 4000
          IF ( KO. GT. 99 ) THEN
               WRITE(6,2600) NSUBR,N ,KO
               CNVRGE  = .FALSE.
               GO TO 4000
          END IF
          ZERO = 0.0
          CALL ESTIM(TCELL,PHI,ZERO,TL,PH,ZERO,0.5,J,NSTR(1) )
 8500     CONTINUE
C
 4000 CONTINUE
C
      R(78) =  MH2OI * 18.0
      R(10) =  MO2 * 32.0
      R(6)  =  MH2OO * 6.0
      R(25) =  2.0 * R(6)
      R(2)  =  TCELL
      R(21) =  TCELL
      R(38) =  MH2 * 2.0
      R(3)  =  R(70)
      R(4)  =  R(70)
      R(22) =  R(70)
      R(23) =  R(70)
      R(65) =  QLOSS
      R(77) =  R(78) * FRAC
      R(90) =  VOLTS
      R(91) =  EFF
      R(92) =  P
C
      IF( TRANS ) THEN
           R(86) =  R(86) +  R(77) * DTIME /3600.0
           R(85) =  TCELL
      END IF
C
      IF( KTRANS.EQ.1  )   R(85) = TCELL
C
      IF   ( ABS((A(1)*(1.0 -FRAC) - R(78))/ R(78)).GT..01 ) THEN
          NCFL =1
          WRITE(6,9013) NCFL
      END IF
C
```

TABLE C-1 (CONTINUED)

LISTING OF KOHHS

```
      IF ( NSTR(17) .EQ.0 .AND. .NOT. CNVRGE ) THEN
          CALL VDATPT (N)
          WRITE(6,9015)
      END IF
 2600 FORMAT ('0',//,10X, '***** NOTICE ***** ',/,  10X,
     1'THE ELECTROLYSIS CELL, SUBROUTINE NO.' ,I3,
     2', COMPONENT NO.' ,I4,' DOES NOT HAVE ' , /, 10X,
     8'A CONVERGENT SOLUTION AFTER ', I4,'TRIALS',
     4'CURRENT VALUES WILL BE RETURNED'      )
 9013 FORMAT(1X,'*** INLET FLOWS DO NOT MATCH ... NCFL = ',I2)
 9015 FORMAT(1X,'*** NSTR(17) = 0 AND NO CNVRGE')
      RETURN
      END
```

TABLE C-2

LISTING OF MOLSIV

```
      SUBROUTINE MOLSIV
C
C     MOLECULAR SIEVE SUBROUTINE
C
C
C     VARIABLES USED:
C
C        ABSHUM - ABSOLUTE HUMIDITY OF ENTERING AIR
C        CMPCFM - COMPRESSOR FLOWRATE, CFM
C        CO2AD  - AMOUNT OF CO2 ADSORBED IN THE PRESENT HALF CYCLE, LB
C        CO2AD1 - AMOUNT OF CO2 ADSORBED IN MOLECULAR SIEVE BED #1
C                 IN THE PREVIOUS CYCLE, LB
C        CO2AD2 - AMOUNT OF CO2 ADSORBED IN MOLECULAR SIEVE BED #2
C                 IN THE PREVIOUS CYCLE, LB
C        CO2DES - AMOUNT OF CO2 DESORBED IN THE PRESENT HALF CYCLE, LB
C        CO2LFT - 1 - (REMOVAL EFFICIENCY, CO2RE)
C        CO2NET - NET CO2 FLOW IN AIR THROUGH MOLSIV SUBSYSTEM, LB/HR
C        CO2RE  - CO2 REMOVAL EFFICIENCY
C        CTIME  - TIME TO COMPLETE ONE FULL CYCLE, SEC
C        DHMS   - ENTHALPY CHANGE FOR ADSORBING MOLECULAR SIEVE BED,
C                 BTU/LB CO2
C        DHSG   - ENTHALPY CHANGE FOR ADSORBING SILICA GEL BED,
C                 BTU/LB-H2O
C        DTIMEH - COMPUTATIONAL TIME STEP, HOURS
C        FANCFM - FAN FLOWRATE, CFM
C        FANDP  - PRESSURE RISE ACROSS FAN, INCHES H2O
C        FANEFF - FAN EFFICIENCY
C        H2OAD  - AMOUNT OF H2O ADSORBED IN THE PRESENT HALF CYCLE, LB
C        H2OAD1 - AMOUNT OF H2O ADSORBED IN SILICA GEL BED #1
C                 IN THE PREVIOUS CYCLE, LB
C        H2OAD2 - AMOUNT OF H2O ADSORBED IN SILICA GEL BED #2
C                 IN THE PREVIOUS CYCLE, LB
C        H2ODES - AMOUNT OF H2O DESORBED IN THE PRESENT HALF CYCLE, LB
C        H2ONET - NET H2O FLOW IN AIR THROUGH MOLSIV SUBSYSTEM, LB/HR
C        HCTIME - TIME TO COMPLETE ONE HALF CYCLE, SEC
C        HCTIMM - TIME TO COMPLETE ONE HALF CYCLE, MIN
C        MCAIR  - MASS FLOWARTE * SPECIFIC HEAT OF BONE DRY GAS,
C                 BTU/HR-F
C        MCO2AD - MASS FLOWRATE OF CO2 CURRENTLY ADSORBED, LB/HR
C        MCO2D  - MASS FLOWRATE OF CO2 CURRENTLY EXITING THE
C                 DESORBING MOL. SIEVE BED, LB/HR
C        MCO2X  - MASS FLOWRATE OF CO2 CURRENTLY EXITING THE
C                 ADSORBING MOLECULAR SIEVE BED
C        MH2OX  - MASS FLOWRATE OF H2O CURRENTLY EXITING THE
C                 DESORBING SILICA GEL BED
C        OCO2AD - AMOUNT OF CO2 ADSORBED IN THE PREVIOUS CYCLE, LB
C        OH2OAD - AMOUNT OF H2O ADSORBED IN THE PREVIOUS CYCLE, LB
C        P7     - PRESSURE INSIDE THE DESORBING MOL. SIEVE BED, PSIA
C        P8     - PRESSURE OF CO2 ACCUMULATOR, PSIA
C        PCO2MM - CO2 PARTIAL PRESSURE OF ENTERING AIR, MM HG
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
C        PCO2   - CO2 PARTIAL PRESSURE OF ENTERING AIR, PSIA
C        PCO25  - CO2 PARTIAL PRESSURE EXITING ADSORBING MOL. SIEVE
C                 BED, PSIA
C        PCOMPR - COMPRESSOR POWER, WATTS
C        PFAN   - FAN POWER, WATTS
C        PH2OX  - H2O PARTIAL PRESSURE EXITING DESORBING
C                 MOL. SIEVE BED, PSIA
C        QCOMPR - COMPRESSOR POWER, BTU/HR
C        QFAN   - FAN POWER, BTU/HR
C        QHX    - HEAT REMOVED BY HEAT EXCHANGER, BTU/HR
C        QMS    - HEAT LOSS TO ENVIRONMENT BY MOL. SIEVE BED, WATTS
C        QSG    - HEAT LOSS TO ENVIRONMENT BY SILICA GEL BED, WATTS
C        T2     - TEMPERATURE OF GAS EXITING THE INLET FAN, F
C        T8     - TEMPERATURE OF GAS EXITING THE ADSORBING SILICA
C                 GEL BED, F
C        T8OLD  - TEMPERATURE OF GAS EXITING THE ADSORBING SILICA
C                 GEL BED AT THE LAST COMPUTATIONAL TIME STEP, F
C        T8MAX  - MAXIMUM TEMPERATURE OF GAS EXITING THE ADSORBING
C                 SILICA GEL BED, F
C        T4     - TEMPERATURE OF GAS EXITING THE HEAT EXCHANGER, F
C        T5     - TEMPERATURE OF GAS EXITING THE ADSORBING MOL. SIEVE
C                 BED, F
C        T5MIN  - MINIMUM TEMPERATURE OF GAS EXITING THE ADSORBING
C                 MOL. SIEVE BED, F
C        T6     - TEMPERATURE OF GAS EXITING THE DESORBING SILICA
C                 GEL BED, F
C        TCABIN - TEMPERATURE OF SURROUNDING CABIN AIR, F
C        TCOOL  - TEMPERATURE OF COOLANT SUPPLIED TO HEAT EXCHANGER, F
C        TCYCLE - ELAPSED TIME OF THE CURRENT CYCLE, SEC
C        THCYCL - ELAPSED TIME OF THE CURRENT HALF CYCLE, SEC
C        TMSDES - MAXIMUM MOL. SIEVE BED DESORBING TEMPERATURE, F
C        TSGDES - MAXIMUM SILICA GEL BED DESORBING TEMPERATURE, F
C        V7     - CO2 SPECIFIC VOLUME INSIDE DESORBING MOL. SIEVE BED
C
C
C
      COMMON  /COMP/ DS(15),N,NA1,NB1,NC,NCAB,NCFL,NEXT,NEXV,NK,
     1  NKHX,NKS,NKT,NLFL,NP,NPASS,NPF,NPFT(6),NQ,NS,NSF,NSFT(6),
     2  NSTH(18),NSUBR,NV,NVT,Y(12)
      COMMON  /RARRAY/  IMAXR,R(160)
      COMMON  /KANDV/ K
      COMMON  /MAXR1/  MAXR
      COMMON  /MISC/  DTIME,GRAV,KFLSYS,KOUTPT,KPDROP,KSYPAS,KTRANS,
     1  LPSUM(5),MAXCI,MAXLP,MAXSLP,MAXSSI,NCOMPS,NEWDT,NLAST,NPASPD,
     2  MINSSI,PGMIN,PLMIN,START,STEADY,TIME,TIMEMX,TMAX,TMIN,WTMAX
      COMMON  /PROPTY/  CPO,CP(99),CPCONL,CPCONV,CPCO2,CPDIL,CPOXY,CPTC,
     1  GAMGAS,RHOO,RHO(99),VISCO,VISC(99),VISGAS,WTMO,WTM(99),WTMCON,
     2  WTMDIL,WTMTC,XKO,XK(99),XKGAS,XKLIQ,VISLIQ
      COMMON  /SOURCE/  A(19),B(19),CPA,CPB,IA1,IB1,NA,NB,NPFS,NPFST(6),
     1  NSFS,NSFST(6),RHOA,RHOB,VISCA,VISCB,WTMA,WTMB,XKA,XKB
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
      DIMENSION V(1),K(1)
      EQUIVALENCE (V(1),K(1))
C
      REAL      MCAIR, MCO2AD, MCO2D, MH2OX, MCO2X
      REAL      MWN2,MWO2,MWH2O,MWCO2,NDOT,MWTOT
      PARAMETER (FANCFM = 28.625, FANDP = 11., FANEFF = 0.85)
      PARAMETER (PFAN = (FANCFM * FANDP) / (3.5 * FANEFF))
      PARAMETER (QFAN = 3.414 * PFAN)
      PARAMETER (CMPCFM =1.05, PCOMPR =90.)
      PARAMETER (QCOMPR = 3.414 * PCOMPR)
      PARAMETER (DHSG = 1400., DHMS = 1800.)
      PARAMETER (CO2RE = 0.65)
      PARAMETER (CO2LFT = 1.- CO2RE)
C
C------------------------------ INITIALIZATIONS ----------------------------
C
      IF ( R(71) .EQ. 1. ) THEN
C  INITIALIZATIONS:
         H2OAD1 = 0.
         H2OAD2 = 0.
         CO2AD1 = 0.
         CO2AD2 = 0.
         H2OAD  = 0.
         CO2AD  = 0.
         H2ODES = 0.
         CO2DES = 0.
         OH2OAD = H2OAD2
         OCO2AD = CO2AD2
         CYCLE = 0.
         R(90) = H2OAD1
         R(91) = H2OAD2
         R(92) = CO2AD1
         R(93) = CO2AD2
         R(94) = H2OAD
         R(95) = CO2AD
         R(96) = H2ODES
         R(97) = CO2DES
         R(98) = OH2OAD
         R(99) = OCO2AD
      END IF
C
      HCTIMM = R(65)
      P7     = R(66)
      P8     = R(67)
      TMSDES = R(68)
      TSGDES = R(69)
      TCABIN = R(70)
      HCTIME = HCTIMM * 60.
      CTIME  = 2. * HCTIME
      DTIMEH = DTIME / 3600.
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
      R(72)  - HCTIME
      R(78)  - CTIME
      R(74)  - DTIMEH
      HALF1  - R(75)
      H2OAD1 - R(90)
      H2OAD2 - R(91)
      CO2AD1 - R(92)
      CO2AD2 - R(93)
      H2OAD  - R(94)
      CO2AD  - R(95)
      H2ODES - R(96)
      CO2DES - R(97)
      OH2OAD - R(98)
      OCO2AD - R(99)
      CYCLE  - R(100)
      T2     - R(101)
      T8     - R(102)
      T5     - R(108)
      T6     - R(104)
      PCO2MM - VV(2,69)
      PCO2   - PCO2MM / 51.715
C
      IF( A(1) .LE. 0.) GOTO 100
C
C---------------- CALCULATE CYCLE AND HALF-CYCLE TIME ----------------
C
      TCYCLE - AMOD (TIME,CTIME)
      THCYCL - AMOD (TIME,HCTIME)
      IF (TCYCLE .EQ. 0.) CYCLE - CYCLE + 1.
C
C---------------------------- FAN ------------------------------------
C
C     FAN EXIT TEMPERATURE:
        T2 - A(2) + QFAN / ( A(1)*CPA )
C     ABSOLUTE HUMIDITY AT FAN EXIT:
        ABSHUM - ( A(6) + A(7) ) / A(5)

C
C---------------- ADSORBING SILICA GEL BED ---------------------------
C
C     MAXIMUM EXIT TEMPERATURE FROM ADSORBING SILICA GEL BED:
        T8MAX - T2 + ABSHUM * DHSG / CPA
C
C     TEMPERATURE OF DRY AIR LEAVING ADSORBING SILICA GEL BED:
        IF ( R(71) .EQ. 1. ) THEN
          T8 - 60.
        ELSE
         IF ( THCYCL .EQ. 0. ) THEN
           T8 - T6
         ELSE
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
          IF ( THCYCL .LT. 600. ) THEN
             SLOPSG = ( T8MAX-T8 ) / ( 600.-THCYCL )
             T8 = T8 + SLOPSG * DTIME
             IF ( T8 .GE. T8MAX ) T8 = T8MAX
          ELSE
             T8 = T8MAX
          END IF
        END IF
       END IF
C
C   WATER REMOVED BY THE ADSORBING SILICA GEL BED:
       H2OAD = H2OAD + ( A(6) + A(7) ) * DTIMEH
C
C---------------------- HEAT EXCHANGER ----------------------------
C
C   TEMPERATURE AND MASS FLOW OF COOL, DRY AIR LEAVING HX:
       TCOOL = R(76)
       T4 = TCOOL + 5.
       MCAIR = A(5) * A(8)
       QHX = MCAIR * (T8 - T4)
C
C------------------ ADSORBING MOLECULAR SIEVE BED ------------------
C
C   CO2 ADSORBED BY ADSORBING MOLECULAR SIEVE BED:
       MCO2AD = A(12) * CO2RE
       CO2AD = CO2AD + MCO2AD * DTIMEH
C
C   PARTIAL PRESSURE OF CO2 REMAINING IN THE DRY, CO2 DEFICIENT AIR
C   EXITING THE ADSORBING MOLECULAR SIEVE BED:
       PCO25 = PCO2 * CO2LFT
       MCO2X = A(12) * CO2LFT
C
C   MINIMUM EXIT TEMPERATURE OF ADSORBING MOLECULAR SIEVE BED:
       T5MIN = T4 + (MCO2AD * DHMS) / MCAIR
C
C   ACTUAL EXIT TEMPERATURE OF ADSORBING MOLECULAR SIEVE BED:
      IF( THCYCL .EQ. 0.) T5 = TMSDES
      IF ( R(71) .EQ. 1. ) T5 = T4
      IF (THCYCL .NE. 0. .AND. THCYCL .LT. 1800.) THEN
         SLOPMS = (T5MIN - T5) / (1800. - THCYCL)
         T5 = T5 + SLOPMS * DTIME
         IF ( T5 .LE. T5MIN ) T5 = T5MIN
       ELSE
         T5 = T5MIN
       END IF
C
C----------------- DESORBING SILICA GEL BED ------------------------
C
C   ACTUAL EXIT TEMPERATURE OF WETTED, CO2 DEFICIENT AIR
C   LEAVING THE DESORBING SILICA GEL BED:
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
      IF(THCYCL .EQ. 0.) T6 = R(102)
C
       IF (TIME .LT. 8600.) THEN
          T6 = T5
       ELSE
          IF ( THCYCL .LT. 1020.) THEN
             SLSGD = ( TSGDES - T6) / (1020.-THCYCL)
             T6 = T6 + SLSGD * DTIME
             IF( T6 .GT. TSGDES) T6 = TSGDES
          END IF
          IF ( THCYCL .EQ. 1020.) T6 = TSGDES
          IF ( THCYCL .GT. 1020. .AND. THCYCL .LT. 2040.) THEN
             SLSGD = (T5MIN - T6)/ (2040. - THCYCL)
             T6 = T6 + SLSGD * DTIME
             IF(T6 .LT. T5MIN) T6 = T5MIN
          END IF
          IF(THCYCL .GE. 2040. .AND. THCYCL .LT. 8600.) T6 = T5MIN
       END IF
C
C   WATER EXITING THE DESORBING SILICA GEL BED:
       PH2OX = PSAT(T6)
       MH2OX = (18./A(9)) * (PH2OX / ( A(8)-PH2OX)) * A(5)
       H2OD  = H2ODES
       H2ODES = H2ODES + MH2OX*DTIMEH
       IF ( H2ODES .GE. OH2OAD ) THEN
          MH2OX = (OH2OAD-H2OD)/DTIMEH
          H2ODES = OH2OAD
       END IF
C
C   HEATER POWER TO DESORBING SILICA GEL BED:
      IF(THCYCL .LT. 240.) THEN
        PHTR = 0.
      ELSE
        PHTR = 657.
      END IF
      QHTR = PHTR * 8.418
C
C   AVERAGE HEAT GIVEN UP BY DESORBING SILICA GEL BED TO CABIN:
       QSG = 22. * (TSGDES - TCABIN) / 110.
C
C--------------- DESORBING MOLECULAR SIEVE BED ---------------
C
C   CO2 DESORPTION OF MOLECULAR SIEVE BED
       IF (THCYCL .GE. 480.) THEN
         V7 = 85.8*(T4+460.) / (P7*144.)
         FACT = 1.01 - 0.01*(P8/P7)**0.769
         MCO2D = FACT*CMPCFM/V7*60.
       ELSE
         MCO2D = 0.
       END IF
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
          CO2D = CO2DES
          CO2DES = CO2DES + MCO2D * DTIMEH
          IF ( CO2DES .GE. OCO2AD ) THEN
            MCO2D = (OCO2AD-CO2D)/DTIMEH
            CO2DES = OCO2AD
          END IF
C
C    AVERAGE HEAT GIVEN UP BY DESORBING MOLEC. SIEVE BED TO CABIN:
          QMS = 46. * (TMSDES - TCABIN) / 290.
C
C-----------------------------------------------------------------------
C------------- UPDATES AT THE END OF ONE HALF-CYCLE --------------------
C
        IF (THCYCL .EQ. 0. ) THEN
           IF (HALF1 .EQ. 1.) THEN
              H2OAD1 = H2OAD
              OH2OAD = H2OAD1
              CO2AD1 = CO2AD
              OCO2AD = CO2AD1
              H2OAD  = H2OAD2 - H2ODES
              CO2AD  = CO2AD2 - CO2DES
              H2ODES = 0.
              CO2DES = 0.
              HALF1  = 0.
           ELSE
              H2OAD2 = H2OAD
              OH2OAD = H2OAD2
              CO2AD2 = CO2AD
              OCO2AD = CO2AD2
              H2OAD  = H2OAD1 - H2ODES
              CO2AD  = CO2AD1 - CO2DES
              H2ODES = 0.
              CO2DES = 0.
              HALF1  = 1.
           END IF
        END IF
100     IF( A(1) .LE. 0. ) THEN
            MH2OX = A(6)
            MCO2X = A(12)
            MCO2D = 0.
            QHTR = 0.
            QHX  = 0.
            QSC  = 0.
            QMS  = 0.
            H2OAD = 0.
            CO2AD = 0.
            H2ODES = 0.
            CO2DES = 0.
            CYCLE = 0.
            T2 = A(2)
```

TABLE C-2 (CONTINUED)

LISTING OF MOLSIV

```
    T3 = A(2)
    T5 = A(2)
    T6 = A(2)
END IF
CO2NET = A(12)-MCO2X
H2ONET = A(6)+A(7)-MH2OX
IF(R(71) .EQ. 1.) R(71) = 0.
T3OLD  = T3
R(2) = T6
R(3) = A(3)
R(4) = A(4)
R(6) = MH2OX
R(7) = 0.
R(10) = A(10)
R(11) = A(11)
R(12) = MCO2X
R(21) = R(70)
R(22) = P3
R(23) = P3
R(31) = MCO2D
R(71) = 0.
R(75) = HALF1
IF( A(1) .LE. 0.) THEN
   R(81) = 0.
   R(82) = 0.
ELSE
   R(81) = QCOMPR
   R(82) = QFAN
END IF
R(83) = QHTR
R(84) = QHX
R(85) = QSG
R(86) = QMS
R(87) = CO2NET
R(88) = H2ONET
R(90) = H2OAD1
R(91) = H2OAD2
R(92) = CO2AD1
R(93) = CO2AD2
R(94) = H2OAD
R(95) = CO2AD
R(96) = H2ODES
R(97) = CO2DES
R(98) = OH2OAD
R(99) = OCO2AD
R(100) = CYCLE
R(101) = T2
R(102) = T3
R(103) = T5
R(104) = T6
```

TABLE C-3

LISTING OF BOSCHS

```
      SUBROUTINE BOSCHS
C
C     THIS SUBROUTINE MODELS A BOSCH REACTOR SYSTEM, CONSISTING OF THE
C     REACTOR, A REGENERATIVE HEAT EXCHANGER, A COMPRESSOR, AND A CON-
C     DENSER.
C
      REAL  MRECYC,MH2CE,MCO2CE,MCH4CE,MCOCE,MH2OCE,MPRC,MASSC
      REAL  IDNUM,MWCMPO
      COMMON   /CASE/    NCASE,NRSCS,NRECS
      COMMON   /COMP/ DS(15),N,NA1,NB1,NC,NCAB,NCFL,NEXT,NEXV,NK,
     1  NKEX,NKS,NKT,NLFL,NP,NPASS,NPF,NPFT(6),NQ,NS,NSF,NSFT(6),
     2  NSTR(18),NSUBR,NV,NVT,Y(12)
      COMMON   /ECLST1/  KCHOUT,KPRNT,KPTINV(4),KWIT,KWIT1,KWIT2,
     1  KWIT3,KWIT4,NUFF,KSTEDY
      COMMON /GPOLYF/    IGPOLY
      COMMON   /KANDV/ K
      COMMON /KASE/ NEWRUN,LASTGO,NUCASE,KASAVE
      COMMON    /KLOC/ IK,IKC,IKS,IKT,IKEX,IP1
      COMMON   /MAXR1/  MAXR
      COMMON   /MISC/  DTIME,GRAV,KFLSYS,KOUTPT,KPDROP,KSYPAS,KTRANS,
     1  LPSUM(5),MAXCI,MAXLP,MAXSLP,MAXSSI,NCOMPS,NEWDT,NLAST,NPASPD,
     2  MINSSI,PCMIN,PLMIN,START,STEADY,TIME,TIMEMX,TMAX,TMIN,WTMAX
      COMMON   /PROPTY/  CPO,CP(99),CPCONL,CPCONV,CPCO2,CPDIL,CPOXY,CPTC,
     1  GAMGAS,RHOO,RHO(99),VISCO,VISC(99),VISGAS,WTMO,WTM(99),WTMCON,
     2  WTMDIL,WTMTC,XKO,XK(99),XKGAS,XKLIQ,VISLIQ
      COMMON   /RARRAY/  IMAXR,R(105)
      COMMON   /SOURCE/  A(19),B(19),CPA,CPB,IA1,IB1,NA,NB,NPFS,NPFST(6),
     1  NSFS,NSFST(6),RHOA,RHOB,VISCA,VISCB,WTMA,WTMB,XKA,XKB
      COMMON /VLENTH/ ISSO,ISS(100),IQLO,IQL(100),ITRO,ITR(100)
      COMMON /VLOC/ IP,IS,IC,IQ,IV,IVT,IEX,INEXK
      COMMON /VPRT/ SLPATH(400),ALPHA(100),ISLP1
      DIMENSION V(1),K(1)
      DOUBLE PRECISION ALPHA
      EQUIVALENCE (V(1),K(1))
      LOGICAL STEADY
C
C  INPUTS:
C
C     A(12) - CO2 INLET FLOW (LB/HR)
C     A(14) - H2 INLET FLOW (LB/HR)
C     B(2)  - INLET COOLANT TEMPERATURE (F)
C     R(65) - MAX. CARBON LOADING FOR CARTRIDGE (LB):  CMAX
C     R(66) - DRY BASIS VOLUME FRACTION OF CO2 IN EXIT GASES:  FRCO2
C     R(67) - DRY BASIS VOLUME FRACTION OF  H2 IN EXIT GASES:  FRH2
C     R(68) - DRY BASIS VOLUME FRACTION OF CH4 IN EXIT GASES:  FRCH4
C     R(69) - DRY BASIS VOLUME FRACTION OF  CO IN EXIT GASES:  FRCO
C     R(70) - EFFECTIVENESS FACTOR FOR CONDENSER:  EC
C     R(71) - EFFECTIVENESS FACTOR FOR REGEN HX:   EHX
C     R(73) - REACTOR PRESSURE (PSIA):  PRCTR
C     R(74) - CONDENSER PRESSURE (PSIA): PCOND
```

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
C      R(76) - AERODYNAMIC EFFICIENCY OF COMPRESSOR:   AECOMP
C      R(77) - MOTOR EFFICIENCY OF COMPRESSOR:   ECOMP
C      R(78) - DESIRED REACTOR TEMP (F):  TRCTRD
C      R(79) - RECYCLE FLOW RATE (LB/HR):   MRECYC
C
C  OUTPUTS:
C
C      R(1) - PRODUCT WATER (LB/HR):  PRH2O
C      R(2) - PRODUCT WATER TEMP (F):  TPRH2O
C      R(7) - R(1) - PRODUCT WATER (LB/HR)
C      R(51) - BOSCH REACTOR TEMP (F): TRCTR
C      R(53) - TOTAL HEAT LOSS TO AMB. (REACTOR + COMPRESSOR), BTU/HR:
C                  QLR + QLCOMP
C      R(72) - HEAT LOSS TO AMBIENT FROM REACTOR, BTU/HR:  QLR
C      R(80) - MASS RATE OF H2  OUT OF COMPRESSOR (LB/HR):  MH2CE
C      R(81) - MASS RATE OF CO2 OUT OF COMPRESSOR (LB/HR):  MCO2CE
C      R(82) - MASS RATE OF CH4 OUT OF COMPRESSOR (LB/HR):  MCH4CE
C      R(83) - MASS RATE OF CO  OUT OF COMPRESSOR (LB/HR):  MCOCE
C      R(84) - MASS RATE OF H2O OUT OF COMPRESSOR (LB/HR):  MH2OCE
C      R(85) - RATE OF CARBON PRODUCTION (LB/HR):  MPRC
C      R(86) - MASS OF CARBON IN CARTRDIGE (LB): MASSC
C      R(87) - IDENTIFICATION NUMBER OF CARTRDIGE IN USE:  IDNUM
C      R(88) - MOLECULAR WEIGHT OF GASES OUT OF COMPRESSOR (LB/LB MOLE):
C                  MWCMPO
C      R(89) - SPECIFIC HEAT OF GASES OUT OF COMPRESSOR (BTU/LB-F):
C                  CPCMPO
C      R(90) - SPECIFIC HEAT RATIO OF GASES OUT OF COMPRESSOR (CP/CV):
C                  GAMCMO
C      R(91) - CONDENSER HEAT LOAD (BTU/HR):  QLCOND
C      R(92) - HEAT LOSS TO AMBIENT FROM COMPRESSOR (BTU/HR):  QLCOMP
C      R(93) - HEAT OF REACTION (BTU/HR):  QRXN
C      R(94) - ACTUAL HEATER POWER BEING DRAWN (BTU/HR):  QHTRNO
C      R(95) - TEMP OF GASES LEAVING REACTOR (F):  T1
C      R(96) - TEMP OF GASES ENTERING REACTOR (F):  T5
C      R(97) - TEMP OF GASES ENTERING CONDENSER (F):  T2
C      R(98) - TEMP OF GASES LEAVING COMPRESSOR (F):  T4
C      R(99) - TEMP OF GASES LEAVING CONDENSER (F):  T3
C      R(100) - TEMP OF GASES ENTERING COMPRESSOR (F):  T6
C      R(101) - THERMAL CAPACITANCE OF BOSCH REACTOR (BTU/F):
C               (INITIAL VALUE IS MODIFIED AS CARBON DEPOSITS)
C      R(102) - REACTOR TEMP BELOW WHICH HEATER TURNS ON, F
C      R(103) - REACTOR TEMP ABOVE WHICH HEATER TURNS OFF, F
C      R(104) - REACTOR TEMP AT PREVIOUS STEP, F
C      R(105) - TOTAL POWER TO COMPRESSOR (WATTS): QCOMPT
C
C
       ITRATE =0
C
       IF(NPASS.EQ.0) THCAPO = R(101)
C
```

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
      TRCTR  - R(61)
      CMAX   - R(65)
      FRCO2  - R(66)
      FRH2   - R(67)
      FRCH4  - R(68)
      FRCO   - R(69)
      EC     - R(70)
      EHX    - R(71)
      QLR    - R(72)
      PRCTR  - R(73)
      PCOND  - R(74)
      QHTR   - R(75)
      AECOMP - R(76)
      ECOMP  - R(77)
      TRCTRD - R(78)
      MRECYC - R(79)
C
C
C ----------------------------------------------------------------------
C     CALCULATE MOLECULAR WEIGHT OF BONE DRY RECYCLE GASES
      IF ( A(14) .EQ. 0.) THEN
         WMH2 - 0.
      ELSE
         WMH2 - A(14)/2.016
      END IF
      WMCO2- A(12)/44.011
      XWBDG - 16.043*FRCH4 + 44.011*FRCO2 + 2.016*FRH2 + 28.011*FRCO
C
C ----------------------------------------------------------------------
C     BEGIN ITERATION ON MASS AND HEAT BALANCES
C     ASSUME THAT TEMPERATURE OF GASES OUT OF CONDENSER IS 20 DEG ABOVE
C     INLET COOLANT TEMPERATURE, AS A FIRST GUESS.
      T3OLD   -  B(02) + 20.
      T3 - T3OLD
C
C ----------------------------------------------------------------------
C     CALCULATE PARTIAL PRESSURE OF WATER IN CONDENSER EXIT GASES
C
C
C ----------------------------------------------------------------------
C ----------------------------------------------------------------------
C ----------------------------------------------------------------------
C
C ----------------------------------------------------------------------
C     CALCULATE RATE OF CARBON FORMATION AND WATER PRODUCTION
C     SEE IF REACTANTS ARE WITHIN 1 PERCENT OF STOICHIOMETRIC RATIO
      NX - NKS+1
      IF (WMH2 .EQ. 0.) THEN
          TEST - 999.
      ELSE
```

C - 2

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
          TEST -  WMC02/WMH2 * 2.0 - 1.
      END IF
      K(NX) - 1
      IF( ABS(TEST) .LE. .01 ) K(NX)    - 0
      TEST1 - A(10)+ A(11)+ A(13) + A(15)+A(16)+A(17)+A(18)+A(19)
C     TEST FOR EXTRANEOUS FLOWS IN FEED SUCH AS O2 AND DILUENT
      NX1- NX+1
      K(NX1) - 0
      IF( TEST1 .NE. 0. ) K(NX1)-1
C ------------------------------------------------------------
C     SEE WHICH IS LIMITING REACTANT
      IF(TEST .LE. 0.0) THEN
C          CO2 LIMITING, HYDROGEN RICH FEED.
           MPRC -   WMCO2   *12.011
           PRH2O -    WMCO2   *2. * 18.016  + A(6)  +  A(7)
      ELSE
C          H2 LIMITING, CO2  RICH FEED
           MPRC -  WMH2  * .5  * 12.011
           PRH2O  -  WMH2  *  18.016   + A(6) + A(7)
      END IF
C
C ------------------------------------------------------------
C     CALCULATE TOTAL FLOW OUT OF CONDENSER
      WCONDO - MRECYC - PRH2O - MPRC
      WATERO - PRH2O
      DUM1  - 18.016/XWBDG
C
C ------------------------------------------------------------
C     CALCULATE COMPRESSOR FACTORS THAT STAY CONSTANT DURING ITERATIONS
      PRATIO - PRCTR/PCOND
C
C
C ------------------------------------------------------------
C
      DO 200 IB - 1,20,1
C
      PW - PSAT( T3 )
      ITRATE - ITRATE + 1
C
C
C ------------------------------------------------------------
C     CALCULATE FLOW RATE OF BONE DRY GAS
      WBDG-WCONDO      /(1.+DUM1* PW/(PCOND-PW) )
C
C ------------------------------------------------------------
C     CALCULATE FLOWS OUT OF COMPRESSOR
      BDGMOL-  WBDG/XWBDG
      WATER -   BDGMOL * PW/PCOND   * 18.016
C     H2
      MH2CE -  A(14) + BDGMOL * FRH2 * 2.016
```

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
C     CO2
      MCO2CE =  A(12) + BDGMOL * FRCO2 * 44.011
C     CH4
      MCH4CE =  BDGMOL * FRCH4 * 16.043
C     CO
      MCOCE =  BDGMOL * FRCO * 28.011
C     H2O
      MH2OCE =  WATER + A(6) + A(7)
      CPBDG =((MH2CE-A(14))*3.42 + (MCO2CE-A(12))*.21 + MCH4CE* .55
     1 + MCOCE*.25 + R(10)*0.22 + R(11)*0.249) /WBDG
C     CALCULATE MOLECULAR WEIGHT OF GASES OUT OF COMPRESSOR
      MWCMPO  = MRECYC/(MH2CE/2.016 + MCO2CE/44.011 + MCH4CE/16.043
     1  + MH2OCE/18.016   + MCOCE/28.011 + R(10)/32. + R(11)/28.008)
C     CALCULATE SPECIFIC HEAT OF COMPRESSOR GASES
      CPCMPO =(3.42*MH2CE + .21 * MCO2CE + .55 * MCH4CE + .25 * MCOCE
     1  +  .49 * MH2OCE + 0.22*R(10) + 0.249*R(11)  )/ MRECYC
C
      WCOMPR = MH2CE+MCO2CE+MCH4CE+MCOCE+MH2OCE
      WCPCMP = WCOMPR * CPCMPO
C     CALCULATE GAMMA OF COMPRESSOR GASES
      GAMCMO =  CPCMPO/( CPCMPO - 1.987/MWCMPO )
C
C ---------------------------------------------------------------
C     CALCULATE ISENTROPIC POWER REQUIREMENT(BTU/HR)
C     FIRST CALCULATE TEMP AT MIX POINT
      T6    =((WBDG *CPBDG   + .49*WATER)* T3 + ( A(12)*.21+A(14)*3.42
     1  +  A(6)* .49 + A(7)* 1.0 ) * A(2))/MRECYC/CPCMPO
      TO = 459.6 + T6
      XN = (GAMCMO-1.)/GAMCMO
      QCOMP = MRECYC*1545.*TO*GAMCMO*(PRATIO**XN-1.)/778./MWCMPO/
     1 (GAMCMO - 1.)/ AECOMP
C     TOTAL POWER TO COMPRESSOR(WATTS)
      QCOMPT =   QCOMP/ECOMP/3.41
C     HEAT FLOW FROM COMPRESSOR TO AMBIENT(BTU/HR)
      QLCOMP =  QCOMPT*3.41 - QCOMP
C
C ---------------------------------------------------------------
C     HEAT OF REACTION(BTU/HR)
      QRXN =  973. * A(12)
C
C ---------------------------------------------------------------
C     TEMPERATURE OUT OF COMPRESSOR
      T4 =  T6 + QCOMP/MRECYC/CPCMPO
C
C ---------------------------------------------------------------
C     TEMPERATURE OUT OF REACTOR
      T1 = TRCTR - QLR / WCPCMP

C
C ---------------------------------------------------------------
```

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
C       TEMPERATURE INTO CONDENSER
        T2     -  T1 - EHX*( T1 - T4 )
C
C
C       TEMPERATURE OF GASES LEAVING CONDENSER
        T8 -  T2 -  EC *(T2- B(2) )
C
C
C       THIS COMPLETES ONE ITERATION ON THERMAL BALANCE
C
C
        TESTT -  T8OLD - T8
        T8OLD -  T8
        IF ( ABS(TESTT).LT.  .8 .OR. ITRATE .GT. 10 ) GO TO 250
200     CONTINUE
C
C
C
C
C
C
250     CONTINUE
C
C       HEAT INTO RECYCLE GASES BY THE REACTOR
        Q42 - WCPCMP * ( T2 - T4 )
        Q51 - Q42
C       TEMPERATURE INTO REACTOR
        T5 - T1 - Q51/WCPCMP
C       TOTAL HEAT LOST TO ENVIRONMENT
        QLTOT - QLR + QLCOMP
        R(58) - QLTOT
C       HEATER SIZING
        QHTR - Q51 + QLR - QRXN
        R(75) - QHTR
        QHTRNO - QHTR
C
C
C       CALCULATE CARBON LOADING
        DHOUR - DTIME/3600.
        IF( STEADY ) THEN
             IDNUM - 0.
             MASSC - CMAX/2.
             TRCTR - TRCTRD
        END IF
C
C
C       HEATER CONTROL LOGIC
        IF ( TRCTR .LT. R(102) ) QHTRNO - QHTR
        IF ( TRCTR .GT. R(103) ) QHTRNO - 0.
        R(104) - TRCTR
```

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
C
C ------------------------------------------------------------------
      IF( .NOT. STEADY) THEN
C     CALCULATE LBS OF CARBON IN CARTRIDGE
           IF( NPASS .EQ. 0 ) THEN
                MASSC=0.
           END IF
           IF ( MASSC .GE. CMAX ) THEN
                MASSC = 0.
                R(101) = THCAPO
                IDNUM = IDNUM + 1.
           END IF
           MASSC =  MASSC + MPRC * DHOUR
           R(101) = R(101) + MASSC*.5
           TRCTR = (MRECYC*(T1-T5)*CPCMPO-R(58)+
     1               QRXN + QHTRNO)*DHOUR/R(101)   + TRCTR
      END IF
C
C ------------------------------------------------------------------
      QLCOND = (WBDG * CPBDG +PRH2O*.49)*(T2- T8) +1050.*PRH2O
      R(1)  = PRH2O
      R(2)  = T8
      R(3)  = A(4)
      R(4)  = PCOND
      R(7)  = WATERO
      R(8)  = CPCONL
      R(9)  = WTMCON
      R(20) = B(1)
      R(21)= B(2) + QLCOND/B(1)/CPB
      R(22)= B(4)
      R(23)= B(4)
      R(80) = MH2CE
      R(81) = MCO2CE
      R(82) = MCH4CE
      R(83) = MCOCE
      R(84) = MH2OCE
      R(85) = MPRC
      R(86) = MASSC
      R(87) = IDNUM
      R(88) = MWCMPO
      R(89) = CPCMPO
      R(90) = GAMCMO
      R(91) = QLCOND
      R(92) = QLCOMP
      R(93) = QRXN
      R(94) = QHTRNO
      R(95) = T1
      R(96) = T5
      R(97) = T2
      R(98) = T4
```

TABLE C-3 (CONTINUED)

LISTING OF BOSCHS

```
      R(99) = T8
      R(100) = T6
      R(105) = QCOMPT
C
      RETURN
C
      END
```

TABLE C-4

LISTING OF CNDHEX

```
      SUBROUTINE CNDHEX
C
C     THIS SUBROUTINE COMPUTES THE PERFORMANCE OF A PLATE FIN
C     CONDENSING HEAT EXCHANGER.
C
      COMMON /PROPTY/ CPO,CP(99),CPCONL,CPCONV,CPCO2,CPDIL,CPOXY,CPTC,
     1  GAMGAS,RHOO,RHO(99),VISCO,VISC(99),VISGAS,WTMO,WTM(99),WTMCON,
     2  WTMDIL,WTMTC,XKO,XK(99),XKGAS,XKLIQ,VISLIQ
      COMMON /CANYHX/ FINAL,CC,CH,XCP(2),KBUZ(3)
     1,IFCPP,IFCPS,IFPTEM,IFSTEM,IFSIZE,IFFLOW
      COMMON  /COMP/ DS(15),N,NA1,NB1,NC,NCAB,NCFL,NEXT,NEXV,NK,
     1  NKEX,NKS,NKT,NLFL,NP,NPASS,NPF,NPFT(6),NQ,NS,NSF,NSFT(6),
     2  NSTR(18),NSUBR,NV,NVT,Y(12)
      COMMON  /RARRAY/  IMAXR,R(128)
      COMMON  /MISC/  DTIME,GRAV,KFLSYS,KOUTPT,KPDROP,KSYPAS,KTRANS,
     1  LPSUM(5),MAXCI,MAXLP,MAXSLP,MAXSSI,NCOMPS,NEWDT,NLAST,NPASPD,
     2  MINSSI,PGMIN,PLMIN,START,STEADY,TIME,TIMEMX,TMAX,TMIN,WTMAX
      COMMON  /SOURCE/  A(19),B(19),CPA,CPB,IA1,IB1,NA,NB,NPFS,NPFST(6),
     1  NSFS,NSFST(6),RHOA,RHOB,VISCA,VISCB,WTMA,WTMB,XKA,XKB
      EQUIVALENCE ( RT(1), R(79))
      DIMENSION RT(1)
      EQUIVALENCE(INSTR(1),NSTR(1))
      DIMENSION  INSTR(18)
      LOGICAL  STEADY,FINAL
      REAL PTOT,PPTHK,INWPP,INABSH,MDOTL
      INTEGER COOLPO
C
C     DEFINITION OF PARAMETERS
C
C     INPUTS:
C
C     HOTFW  - HOT FLOW WIDTH (INCHES)
C     HOTFLL - HOT FLOW LENGTH (INCHES)
C     NCOOLP - NUMBER OF COOLANT PASSES
C     NCFILL - NUMBER OF COLD FIN LAYERS
C     NHFINL - NUMBER OF HOT FIN LAYERS
C     CFINHT - COLD FIN HEIGHT (INCHES)
C     HFINHT - HOT FIN HEIGHT (INCHES)
C     CFINTK - COLD FIN THICKNESS (INCHES)
C     HFINTK - HOT FIN THICKNESS (INCHES)
C     NCFIN  - NUMBER OF COLD FINS
C     NHFIN  - NUMBER OF HOT FINS
C     CFINK  - COLD FIN THERMAL CONDUCTIVITY
C     HFINK  - HOT FIN THERMAL CONDUCTIVITY
C
C     INTERMEDIATE:
C
C     CFL    - COLD FLOW LENGTH (INCHES)
C     CSSAR  - COLD SECONDARY SURFACE AREA (FT-2)
C     HSSAR  - HOT SECONDARY SURFACE AREA (FT-2)
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
C      CPRSA  - COLD PRIMARY SURFACE AREA (FT-2)
C      HPRSA  - HOT PRIMARY SURFACE AREA (FT-2)
C      TCSA   - COLD SIDE TOTAL SURFACE AREA (FT-2)
C      THSA   - HOT SIDE TOTAL SURFACE AREA (FT-2)
C      CFLWA  - COLD FLOW AREA (FT-2)
C      HFLWA  - HOT FLOW AREA (FT-2)
C      CHYDRD - COLD HYDRAULIC DIAMETER (FT)
C      HHYDRD - HOT HYDRAULIC DIAMETER (FT)
C      INABSH - INLET ABSOLUTE HUMIDITY
C      INWPP  - INLET WATER VAPOR PARTIAL PRESSURE (PSIA)
C      DPIN   - INLET DEW POINT (F)
C      OUTWPP - OUTLET WATER VAPOR PARTIAL PRESSURE (PSIA)
C      OUTABH - OUTLET ABSOLUTE HUMIDITY
C      QLAT   - LATENT HEAT LOAD (BTU/HR)
C      QSENS  - SENSIBLE HEAT LOAD (BTU/HR)
C      QTOT   - TOTAL HEAT LOAD (BTU/HR)
C      FS     - FACTOR OF SAFETY
C      COUT   - COOLANT OUTLET TEMPERATURE (F)
C      CVISC  - COOLANT VISCOSITY (LB/FT-HR)
C      HVISC  - HOT VISCOSITY (LB/FT-HR)
C      CCOND  - COLD THERMAL CONDUCTIVITY (BTU/HR-FT-F)
C      HCOND  - HOT THERMAL CONDUCTIVITY (BTU/HR-FT-F)
C      CPRAND - COLD PRANDLT NUMBER
C      HPRAND - HOT PRANDLT NUMBER
C      CFLWUA - COLD FLOW PER UNIT AREA (LB/HR-FT-2)
C      HFLWUA - HOT FLOW PER UNIT AREA (LB/HR-FT-2)
C      CRENNO - COLD REYNOLDS NUMBER
C      HRENNO - HOT REYNOLDS NUMBER
C      CCOBRN - COLD COBURN FACTOR
C      HCOBRN - HOT COBURN FACTOR
C      CCFMOD - COLD MODIFIED COBURN FACTOR
C      HCFMOD - HOT MODIFIED COBURN FACTOR
C      CFCOF  - COLD FILM COEFFICIENT (BTU/HR-FT2-F)
C      HFCOF  - HOT FILM COEFFICIENT (BTU/HR-FT2-F)
C      COFINE - COLD OVERALL FIN EFFICIENCY
C      HOFINE - HOT OVERALL FIN EFFICIENCY
C      CEFC   - COLD EFFECTIVE FILM COEFFICIENT (BTU/HR-FT2-F)
C      HEFC   - HOT EFFECTIVE FILM COEFFICIENT (BTU/HR-FT2-F)
C      HACEFF - COLD EFFECTIVE UA (BTU/HR-F)
C      HAHEFF - HOT EFFECTIVE UA (BTU/HR-F)
C      TEDUA1 - TOTAL DRY UA (BTU/HR-F)
C      HWCP   - HOT SIDE (W CP) (BTU/HR-F)
C      AIRPP  - PINCH POINT AIR SIDE TEMPERATURE (F)
C      COOLPP - PINCH POINT COOLANT TEMPERATURE (F)
C      WTLMTD - WET SECTION LMTD (F)
C      DYLMTD - DRY SECTION LMTD (F)
C      WSDUA  - WET SECTION DRY UA (BTU/HR-F)
C      DSDUA  - DRY SECTION DRY UA (BTU/HR-F)
C      TEDUA2 - TOTAL EFFECTIVE DRY UA (BTU/HR-F)
C
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
C     OUTPUT:
C
C     R(2)   - HOT SIDE OUTLET TEMPERATURE (F)
C     R(6)   - HOT SIDE CONDENSABLE VAPOR FLOW (LBM/HR)
C     R(7)   - HOT SIDE ENTRAINED LIQUID FLOW (LBM/HR)
C     R(21)  - COLD SIDE OUTLET TEMERATURE (F)
C
      PARAMETER(HOTFW  - 8.60)
      PARAMETER(HOTFLL - 11.13)
      PARAMETER(NCOOLP - 4)
      PARAMETER(NCFINL - 28)
      PARAMETER(NHFINL - 28)
      PARAMETER(CFINHT - 0.1)
      PARAMETER(HFINHT - 0.20)
      PARAMETER(CFINTK - .002)
      PARAMETER(HFINTK - .002)
      PARAMETER(NCFIN  - 28)
      PARAMETER(NHFIN  - 16)
      PARAMETER(CFINK  - 9.4)
      PARAMETER(HFINK  - 9.4)
      PARAMETER(CFL- (HOTFW+HFINHT*2.)-2.*CFINHT)
      PARAMETER(CSSAR - CFL*HOTFLL*NCFINL*NCFIN*(CFINHT-CFINTK)/72.0)
      PARAMETER(HSSAR - HOTFW*HOTFLL*NHFINL*NHFIN*(HFINHT-HFINTK)/72.0)
      PARAMETER(CPRSA - CFL*HOTFLL*NCFINL*(1.-NCFIN*CFINTK)/72.)
      PARAMETER(HPRSA - HOTFW*HOTFLL*NHFINL*(1.-NHFIN*HFINTK)/72.)
      PARAMETER(TCSA - CSSAR+CPRSA)
      PARAMETER(THSA - HSSAR+HPRSA)
      PARAMETER(CFLWA - HOTFLL/NCOOLP*NCFINL*(1.-NCFIN*CFINTK)*
     1    (CFINHT-CFINTK)/144.)
      PARAMETER(HFLWA - HOTFW*NHFINL*(1.-NHFIN*HFINTK)*(HFINHT
     1    -HFINTK)/144.)
      PARAMETER(CHYDRD - (1./NCFIN-CFINTK)*(CFINHT-CFINTK)/(6.*((1./
     1    NCFIN-CFINTK)+(CFINHT-CFINTK))))
      PARAMETER(HHYDRD - (1./NHFIN-HFINTK)*(HFINHT-HFINTK)/(6.*((1./
     1    NHFIN-HFINTK)+(HFINHT-HFINTK))))
C
C      INITIALIZE THE R ARRAY
C
          DO 10 I-1,19
          R(I) - A(I)
  10      R(I+19) - B(I)
C
C      INTITIALIZE PROGRAM VARIABLES
C
       IF(A(1) .GT. B(1)/10.) THEN
       CCP    - CPB
       HCP    - CPA
       STEMCP - CPCONV
       HOTFLW - R(1)
       COLFLW - R(20)
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
      HOTIN  - R(2)
      CIN    - R(21)
      PTOT   - R(8)
      COOLPO - KK(N,16)
      HOTOUT - ((HOTIN-CIN)/4.)+CIN
C
C     CALCULATE INLET DEW POINT
C
      INABSH - R(6)/R(5)
      INWPP  - (PTOT*INABSH)/(INABSH+0.622)
      DPIN   - TSAT(INWPP)
      RJ     - 0.
      BAND   - CIN+2.0
C
         DO 50 I-1,50
         OUTWPP - PSAT(HOTOUT)
         OUTABH - 0.622*OUTWPP/(PTOT-OUTWPP)
         OUTABH - AMIN1(OUTABH,INABSH)
C
C        LATENT,SENSIBLE AND TOTAL HEAT LOAD (BTU/HR)
C
         AVEHFG - 1094.1-0.575*(DPIN+HOTOUT)/2.
         QLAT   - R(5)*(INABSH-OUTABH)*AVEHFG
         QLAT   - AMAX1(0.,QLAT)
         QSENS - HOTFLW*HCP*(HOTIN-HOTOUT)
         QTOT - QLAT+QSENS
C
C        CALCULATE FACTOR OF SAFETY
C
         IF(COOLPO .EQ. 1) THEN
             CONST - 0.44
         ELSE
             CONST - -0.04
         END IF
         FS - 1.094 *QTOT/QSENS+CONST
C
C        OUTLET COLD FLUID TEMPERATURE (F)
C
         COUT - CIN+QTOT/COLFLW*CCP
C
C        VISCOSITY,THERMAL CONDUCTIVITY,PRANDLT NO.,FLOW/AREA,REYNOLDS
C        NO.,COBURN FACTOR,MODIFIED CF
C
         CVISC - -0.808+219.56/((CIN+COUT)/2.)-2286.14/(
     1   (CIN+COUT)/2.)**2.
         HVISC - 0.0000685*((HOTIN+HOTOUT)/2.0)+0.03991
C
         CCOND - 0.2905+0.00095*((CIN+COUT)/2.)-0.000002186*(
     1   (CIN+COUT)/2.)**2.
         HCOND - 0.0000206*(HOTIN+HOTOUT)/2.+0.01884
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
C
          CPRAND - CVISC*CCP/CCOND
          HPRAND - HVISC*HCP/HCOND
C
          CFLWUA - COLFLW/CFLWA
          HFLWUA - (1.+(INABSH+OUTABH)/2.)*HOTFLW/HFLWA
C
          CRENNO - CHYDRD*CFLWUA/CVISC
          HRENNO - HHYDRD*HFLWUA/HVISC
C
          IF (CRENNO .LE. 500.) THEN
              CCOBRN - (1./CRENNO**.2288)*0.07081
          ELSE
              CCOBRN - (1./CRENNO**.4249)*.2454
          END IF
          IF (HRENNO .LE. 500.) THEN
              HCOBRN - (1./HRENNO**.2288)*0.07081
          ELSE
              HCOBRN - (1./HRENNO**.4249)*.2454
          END IF
C
          CCFMOD - (18./NCFIN)**0.284*CCOBRN
          HCFMOD - (18./NHFIN)**0.284*HCOBRN
C
C         FILM COEFFICIENT (BTU/HR-FT2-F)
C
          TEMP1 - 8.65*CCOND/CHYDRD
          TEMP2 - CCFMOD*CCP*CFLWUA/CPRAND**.6667
          CFCOF - AMAX1(TEMP1,TEMP2)
          TEMP3 - 8.65*HCOND/HHYDRD
          TEMP4 - HCFMOD*HCP*HFLWUA/HPRAND**.6667
          HFCOF - AMAX1(TEMP3,TEMP4)
C
C         FIN EFFICIENCY AND OVERALL FIN EFFICIENCY CALCULATION
C
          TEMPC - SQRT(2.*CFCOF/(12.*CFINK*CFINTK))*CFINHT/2.
          TEMPH - SQRT(2.*HFCOF/(12.*HFINK*HFINTK))*HFINHT/2.
          CFINEF - (EXP(TEMPC)-EXP(-TEMPC))/(EXP(TEMPC)+EXP(-
     1    TEMPC))/TEMPC
          HFINEF - (EXP(TEMPH)-EXP(-TEMPH))/(EXP(TEMPH)+EXP(-TEMPH))/
     1    TEMPH
          COFINE - 1.-CSSAR/TCSA*(1.-CFINEF)
          HOFINE - 1.-HSSAR/THSA*(1.-HFINEF)
C
          CEFC - COFINE*CFCOF
          HEFC - HOFINE*HFCOF
C
C         EFFECTIVE HA (BTU/HR-F)
C
          HACEFF - CEFC*TCSA
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
          HAHEFF = HEFC*THSA
C
C         DETERMIN IF THE HEAT EXCHANGER IS DRY OR CONDENSING.
C
          IF (DPIN .GT. CIN+0.50) THEN
C
C            TOTAL EFFECTIVE DRY UA (BTU/HR-F)
C
             IF (COOLPO .EQ. 1) THEN
                TEDUA1 = ((1./(2.*(1./HACEFF+1./HAHEFF)))+(1./(2.*(1./
     1          HACEFF+1./HAHEFF)+12.*CFINHT/(CFINK*NCFIN*CFINTK*HOTFLL
     2          *HOTFLW*NCFINL))))/FS
             ELSE
                TEDUA1 = (1./(1./HACEFF+1./HAHEFF))/FS
             END IF
C
             HWCP = A(1)*CPA
C
C            PINCH POINT AIR SIDE AND COOLANT TEMPERATURE (F)
C
             AIRPP = ((HAHEFF/HACEFF*DPIN+DPIN-COUT)*CCP*COLFLW+HWCP*
     1       HOTIN)/(HWCP+CCP*COLFLW*HAHEFF/HACEFF)
             AIRPP = AMAX1(AIRPP,HOTOUT)
             COOLPP = DPIN-HAHEFF/HACEFF*(AIRPP-DPIN)
             COOLPP = AMAX1(COOLPP,CIN)
C
C            WET AND DRY SECTION LMTD (F)
C
             RATIO = (HOTOUT-CIN)/(AIRPP-COOLPP)
             IF (RATIO .LE. 0.0) THEN
                WTLMTD = 1.
             ELSE IF((ABS(RATIO)-1.) .LT. 0.0001) THEN
                WTLMTD = HOTOUT-CIN
             ELSE
                WTLMTD = ((HOTOUT-CIN)-(AIRPP-COOLPP))/ALOG((HOTOUT-
     1          CIN)/(AIRPP-COOLPP))
             END IF
             IF (AIRPP .LT. CIN .OR. AIRPP .GT. HOTIN .OR. COOLPP .LE.
     1          CIN .OR. COOLPP .GT. COUT .OR. COOLPP .GT. AIRPP) THEN
                DYLMTD = 4.
             ELSE
                DYLMTD = ABS(((AIRPP-COOLPP)-(HOTIN-COUT))/ALOG((AIRPP
     1          -COOLPP)/(HOTIN-COUT)))
             END IF
C
C            WET SECTION AND DRY SECTION DRY UA (BTU/HR-F)
C
             TEMP1 = COOLPP-CIN
             IF (TEMP1 .GT. 0.0 .AND. WTLMTD .GT. 0.0) THEN
                WSDUA = COLFLW*(COOLPP-CIN)/WTLMTD*(HACEFF/HAHEFF+
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
     1          QTOT/QSENS)/(QTOT/QSENS*(HACEFF/HAHEFF+1.))
            ELSE
                WSDUA - 0.0
            END IF
            TEMP1 - COUT-COOLPP
            IF(DYLMTD .GT. 0.0 .AND. TEMP1 .GT. 0.0) THEN
                DSDUA - COLFLW*(COUT-COOLPP)/DYLMTD
            ELSE
                DSDUA - 0.0
            END IF
C
C           TOTAL EFFECTIVE DRY UA (BTU-HR-F)
C
            TEDUA2 - WSDUA+DSDUA
C
C           NEWTON-RHAPSON ITERATION ON THE HOT SIDE OUTLET
C           TEMP. UNTIL THE EFFEXTIVE DRY UA'S ARE WITHIN 1 BTU-HR-F
C
            ERROR - TEDUA2-TEDUA1
            IF (ABS(ERROR) .LE. 8.0) GO TO 100
            IF (I .EQ. 1) THEN
                HOTNEW - 1.01*HOTOUT
            ELSE
                CHCK1 - HOTOUT-HOTOLD
                IF (CHCK1 .GT. -0.00001 .AND. CHCK1 .LT. 0.00001)THEN
                    CHCK1 - 0.0001
                END IF
                IF (ABS(ERROR-ERROLD) .GT. 0.00001) THEN
                    SLOPE  - (ERROR-ERROLD)/CHCK1
                    CRINC  - ERROR/SLOPE
                    HOTNEW - HOTOUT-CRINC/4.
                ELSE
                    HOTNEW - HOTNEW*1.01
                END IF
                IF (HOTNEW .GT. HOTIN) THEN
                    HOTNEW - (HOTIN-CIN)/4.+CIN-RJ
                    RJ - RJ+1.
                END IF
                IF(HOTNEW .LT. CIN) THEN
                    HOTNEW - (HOTOUT+BAND)/2.0
                    IF (ABS(HOTNEW-HOTOUT) .LT. 0.0001) GO TO 100
                END IF
            END IF
            HOTOLD - HOTOUT
            ERROLD - ERROR
            HOTOUT - HOTNEW
            IF (I .EQ. 50 ) THEN
                WRITE(6,45) I
                NSTR(17) - 1
            END IF
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
         ELSE
            IF(COOLPO .EQ. 1) THEN
               C1 = (12.*CFINHT)/(CFINK*NCFIN*CFINTK*HOTFLL*HOTFW*
     1               NCFINL)
            ELSE
               C1 = 0.0
            END IF
            DRYUA = (1./(2.*(1./HACEFF+1./HAHEFF))+1./(2.*(1./HACEFF
     1              +1./HAHEFF)+C1))*(1./FS)
C
C           NTU'S PER PASS
C
            PSSNTU = DRYUA/(HOTFLW*HCP*NCOOLP)
C
C           MASS FLOW RATIO
C
            FLWRTO = HOTFLW*HCP/(COLFLW*CCP)
C
C           EFFECTIVENESS PER PASS
C
            C2    = EXP(-PSSNTU**0.78*FLWRTO)
            C8    = EXP((C2-1.)/(FLWRTO/PSSNTU**.22))
            EFFPP = 1.-C8
C
C           OVERALL EFFECTIVENESS
C
            C4    = ((1.-EFFPP*FLWRTO)/(1.-EFFPP))**NCOOLP
            OVEFF = (C4-1.)/(C4-FLWRTO)
C
C           AIR OUTLET TEMPERATURE
C
            HOTNEW = HOTIN-OVEFF*(HOTIN-CIN)
            IF (ABS(HOTNEW-HOTOUT) .LE. 0.1) GO TO 100
            HOTOUT = HOTNEW
         END IF
   50    CONTINUE
C
C     CALCULATED THE CONDENSED LIQUID (LBM/HR)
C
  100 MDOTL = R(5)*(INABSH-OUTABH)
      H2OV  = R(6)-MDOTL
C
C     STORE RESULTS IN R ARRAY FOR G189 SOLUTION
C
      R(2)  = AMAX1(HOTOUT,B(2))
      R(6)  = H2OV
      R(7)  = MDOTL
      R(21) = COUT
      ELSE
```

TABLE C-4 (CONTINUED)

LISTING OF CNDHEX

```
          R(2)  - B(2)
          R(21) - B(2)
      END IF
C
C     PROGRAM DEBUG OUTPUT
C
C     IF (TIME .GE. 8000. .AND. TIME .LE. 8600.) THEN
C         NSTR(17) - 1
C     ELSE
C         NSTR(17) - 0
C     END IF
C
C     FORMAT STATEMENTS
C
 45   FORMAT (' ****ERROR****THE CONDENSING HEAT EXCHANGERS UA DOES
     1NOT CONVERGE AFTER ',I2,'INTERATIONS.')
      RETURN
      END
```

C.4 Program Use

The following section presents the procedures to use the program on the Hamilton Standard IBM or the NASA Langley Prime Computers. Also, instructions are given to allow the user to swap one CO_2 removal subsystem for another, to modify the input data, and to change control logic.

C.4.1 Operation Using the Hamilton Standard IBM Computer

To run the Space Station simulation model, use the following sequence of steps:

(1) Access the command list from the G15UARL library:

```
LGCL G189CL G15UARL
```

(2) Access the input data set:

```
LG SSDATA DATA SO(G15UARL)
```

C.4 Program Use (Continued)

(3) Make desired changes to SSDATA.DATA.

(4) Enter the following command:

EX G189CL

More detailed information on each of these steps is provided in the following sections.

C.4.1.1 The Command List G189CL

G198CL is a general command list to run any FORTRAN 77 G198A load module. A listing of this command list is provided in Table C-5 and a description of the file assignments is given in Table C-6.

TABLE C-5

LISTING OF G189CL FOR SPACE STATION MODEL

```
CONTROL PROMPT NOMSG
ERASE
N1: DELETE PLOT.DATA
    DELETE PLTCAT.DATA
    DELETE OUT.DATA
    DELETE OUT1.DATA
    DELETE OUT2.DATA
    DELETE OUT3.DATA
FREE FILE(FT05F001)
FREE FILE(FT06F001)
FREE FILE(FT07F001)
FREE FILE(FT08F001)
FREE FILE(FT09F001)
FREE FILE(FT10F001)
FREE FILE(FT11F001)
FREE FILE(FT16F001)
FREE FILE(FT20F001)
FREE FILE(FT30F001)
FREE FILE(FT31F001)
FREE FILE(FT41F001)
FREE FILE(FT42F001)
FREE FILE(FT43F001)
FREE FILE(FT44F001)
FREE FILE(FT45F001)
FREE ATTRLIST(A1 B2 C3 D4 E5)
ATTRIB A1 BLKSIZE(844)  RECFM(V B)   LRECL(844)
ATTRIB B2 BLKSIZE(10000) RECFM(V B S) LRECL(10000)
ATTRIB C3 BLKSIZE(8404) RECFM(V B S) LRECL(8404)
ATTRIB D4 BLKSIZE(8990) RECFM(F B A) LRECL(133)
ATTRIB E5 BLKSIZE(8990) RECFM(F B) LRECL(80)
DELETE DD1
DELETE DD2
DELETE DD3
DELETE DD4
DELETE DD5
DELETE DD6
DELETE IN10
DELETE IN11
WRITE
WRITE
WRITE  DATA SETS ARE NOW BEING ALLOCATED.
ALLOC DS(DD1) F(FT41F001) NEW SPACE(844,200)  BLOCK(844) +
         USING(A1)   DELETE
ALLOC DS(DD2) F(FT42F001) NEW SPACE(200,200) BLOCK(10000) +
         USING(B2)   DELETE
ALLOC DS(DD3) F(FT43F001) NEW SPACE(200,200) BLOCK(8404) +
         USING(C3)   DELETE
ALLOC DS(DD4) F(FT44F001) NEW SPACE(200,200) BLOCK(8403) +
         USING(C3)   DELETE
ALLOC DS(DD5) F(FT30F001) NEW SPACE(200,200) BLOCK(8403) +
```

TABLE C-5 (CONTINUED)

LISTING OF G189CL FOR SPACE STATION MODEL

```
          USING(C8)   DELETE
ALLOC DS(DD6) F(FT81F001) NEW SPACE(200,200) BLOCK(8408) +
          USING(C8)   DELETE
ALLOC DS(IN10) F(FT10F001) NEW SPACE(200,200) BLOCK(8408) +
         USING(C8)   DELETE
ALLOC DS(IN11) F(FT11F001) NEW SPACE(200,200) BLOCK(8408) +
         USING(C8)   DELETE
ALLOC DS(SSDATA.DATA) F(FT05F001)
ALLOC DS(OUT.DATA) F(FT06F001) NEW SPACE(200,200) BLOCK(8120) +
         USING(D4)   CATALOG
ALLOC DS(OUT1.DATA) F(FT07F001) NEW SPACE(200,200) BLOCK(8120) +
         USING(D4)   CATALOG
ALLOC DS(OUT2.DATA) F(FT08F001) NEW SPACE(200,200) BLOCK(8120) +
         USING(D4)   CATALOG
ALLOC DS(OUT8.DATA) F(FT09F001) NEW SPACE(200,200) BLOCK(8120) +
         USING(D4)   CATALOG
ALLOC DS(PLTCAT.DATA) F(FT45F001) NEW SPACE(200,200) BLOCK(8120) +
         USING(E5)   CATALOG
ALLOC DS(PLOT.DATA) F(FT16F001) NEW SPACE(200,200) BLOCK(8408) +
       UNIT(TSOWRKB) USING(C8)   CATALOG
ALLOC DS(*)   F(FT20F001)
CONTROL MSG
WRITE
WRITE  DATA SETS HAVE BEEN ALLOCATED.  PROGRAM IS NOW EXECUTING.
TIME
CALL 'ENG.G15.LM(SS)'
WRITE
WRITE  THE PROGRAM HAS FINISHED.
TIME
END
```

TABLE C-6
I/O FILE ASSIGNMENTS

File Name	No.	File Type	Status	Comments
SSDATA	5	Formatted	INPUT	Problem Input Data
OUT	6	Formatted	OUTPUT	Output For Printer Listing of Habitat Conditions
OUT1	7	Formatted	OUTPUT	Printer Output of Nodal Conditions
OUT2	8	Formatted	OUTPUT	Printer Output of Station Performance
OUT3	9	Formatted	OUTPUT	Printer Output of Station Performance
IN10	10	Unformatted	INPUT	Input File for Data Tape
IN11	11	Unformatted	OUTPUT	Output File for Data Tape
PLOT	16	Formatted	OUTPUT	Plot File for Use with MERIAM
---	20	Formatted	OUTPUT	Special Output to Interactive Terminal
DD5	30	Formatted	Unknown	Used by IEDIT Subroutine
DD6	31	Formatted	OUTPUT	Card Punch File (Used Only When Punch Card Selected)
DD1	41	Formatted	SCRATCH	File Built in IEDIT, Containing Problem Input Data for Current Run
DD2	42	Unformatted	SCRATCH	File Used for Merging Operations During Creations of Basic Cases Used for Holding K/V Array Data of Basic Case or Restart Case
DD3	43	Unformatted	SCRATCH	File Which Contains the Sorted Component Data Card Images Plus Sort Number for the Basic Case
DD4	44	Unformatted	SCRATCH	File Which Contains the Sorted Table Data Card Images Plus Sort Number for the Basic Case
PLTCAT	45	Unformatted	OUTPUT	File for Storing Data to be Plotted With CAET/MS Plot Program

C.4.1.2 Input Data SSDATA Description

The input data for the Space Station simulation model is shown in Table C-7. The data set is divided into five sections. The first section contains user options and initial conditions for the habitat and laboratory air. These are located up front for ease of the user to make selections.

The second section contains the KBAS cards for all components in the system except for ECLS equipment like an O_2 generator. The KBAS card defines the subroutine for analyzing the component, the components which provide film to the component, and the next component to be solved in the solution path.

The third section contains all the other cards for all components in the system except for ECLS equipment. These are the ID, NSTR, KARY, and VARY cards.

The forth section is the library of all ECLS components. These components to date in the library are:

CO_2 Reduction

- Sabatier
- Bosch

O_2 Generation

- SPE
- SFWES (KOH)

TABLE C-7

INPUT DATA FOR SPACE STATION MODEL

```
 INPUT CARD IMAGES LISTED BELOW

 IOUT =     0  IPRT =     0
      **** NAMELIST, BASIC CASE
TAPE                          0
BASIC          1     593     21       2    YEA       NAY
CASE           SPACE STATION ARS SIMULATION MODEL

 $CASE1
  KPTINV(1)= 1, KPTINV(2)= 5, KPTINV(3)= 10, KPTINV(4)=30,
  KCHOUT= 0, KPUNCH= 0, KPRNT= 0, KRUN= 2, KSTEDY= 0,
  MAXSLP= 4, MAXSSI= 15, MINSSI= 10, NOLIM=0,
  DTIME=60., START= 0.0, TIMEMX=86400.,
  TMAX= 500.0, TMIN= 0.0, WTMAX= 1.6E6  $END

 $PROP1
  CP(1)=1.0, RHO(1)=62.4000, VISC(1)=2.420, WTM(1)=18.016,  XK(1)=0.34,
  CP(2)=0.2, RHO(2)=0.00045, VISC(2)=0.378, WTM(2)=44.01, XK(2)=0.0098,
  CP(3)=3.42,RHO(3)=0.00520, VISC(3)=0.021, WTM(3)=2.016, XK(3)=0.1032,
  CP(4)=0.52,RHO(4)=0.04150, VISC(4)=0.026, WTM(4)=16.04, XK(4)=0.0191,
  CPCONL=1., CPCONV=0.445,CPCO2=0.2, CPDIL=0.25, CPOXY=0.22, CPTC=0.2,
  GAMGAS=1.4,VISGAS=.44,WTMCON=18.016,WTMDIL=28.013,WTMTC=20.,
  XKGAS=0.146 $END

ID**  80   1  THE FOLLOWING ARE OPTIONS TO BE SELECTED BY THE USER:
ID**  80   2
KBAS  80     49 11 22        2
NSTR  80    0                    SUBROUTINE OPTIONS
KARY  80  16          0     PROCESS AIR BUS?                        1=YES, 0=NO
KARY  80  17          0     CO2 GAS BUS?  0=NONE, 1=INTRAMOD, 2=INTERMOD
KARY  80  18          0     N2 GAS BUS?                             1=YES, 0=NO
KARY  80  19          0     H2 GAS BUS?                      0=NONE,1=INTRAMOD
KARY  80  20          1     HABITAT O2 GEN #1 ON?                   1=YES, 0=NO
KARY  80  21          1     HABITAT CO2 REMOVAL #1 ON?              1=YES, 0=NO
KARY  80  22          1     HABITAT CO2 REDUCTION #1 ON?            1=YES, 0=NO
KARY  80  23          1     HABITAT CAT OX #1 ON?                   1=YES, 0=NO
KARY  80  24          0     HABITAT O2 GEN #2 ON?                   1=YES, 0=NO
KARY  80  25          0     HABITAT CO2 REMOVAL #2 ON?              1=YES, 0=NO
KARY  80  26          0     HABITAT CO2 REDUCTION #2 ON?            1=YES, 0=NO
KARY  80  27          0     HABITAT CAT OX #2 ON?                   1=YES, 0=NO
KARY  80  28          1     LABORATORY O2 GEN #1 ON?                1=YES, 0=NO
KARY  80  29          1     LABORATORY CO2 REMOVAL #1 ON?           1=YES, 0=NO
KARY  80  30          1     LABORATORY CO2 REDUCTION #1 ON?         1=YES, 0=NO
KARY  80  31          1     LABORATORY CAT OX #1 ON?                1=YES, 0=NO
KARY  80  32          0     LABORATORY O2 GEN #2 ON?                1=YES, 0=NO
KARY  80  33          0     LABORATORY CO2 REMOVAL #2 ON?           1=YES, 0=NO
KARY  80  34          0     LABORATORY CO2 REDUCTION #2 ON?         1=YES, 0=NO
KARY  80  35          0     LABORATORY CAT OX #2 ON?                1=YES, 0=NO
VARY  80  65   5.0          PRINTOFF FREQUENCY, TIMESTEPS PER PRINTOFF
VARY  80  66  70.0          HABITAT GAS MIXTURE: INITIAL TEMPERATURE (F)
VARY  80  67  14.7          HABITAT TOTAL PRESSURE (PSIA)
VARY  80  68   2.8          HABITAT GAS CO2 PRESSURE (MMHG)
VARY  80  69  50.0          HABITAT DEW POINT TEMPERATURE (F)
VARY  80  70  3.09          HABITAT O2 PARTIAL PRESSURE (PSIA)
VARY  80  71  70.0          LABORATORY GAS MIXTURE: INITIAL TEMP (F)
VARY  80  72  14.7          LABORATORY TOTAL PRESSURE (PSIA)
VARY  80  73   2.5          LABORATORY GAS CO2 PRESSURE (MMHG)
VARY  80  74  50.0          LABORATORY DEW POINT TEMPERATURE (F)
VARY  80  75  3.09          LABORATORY O2 PARTIAL PRESSURE (PSIA)
KBAS   1       1 26         3 2   3               -8 2   3             7    1
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

KBAS	2	1	26		4	2	3	-9	2	3	10	2
KBAS	3	2	1		165	2	3				2	1
KBAS	4	2	1		365	2	3				18	2
KBAS	5	6			1	2	3	-42	2	3	216	1
KBAS	6	6			2	2	3	-62	2	3	351	2
KBAS	7	10			-1	2	3				13	1
KBAS	8	6			52	2	3	-42	2	3	151	1
KBAS	9	6			72	2	3	-62	2	3	351	2
KBAS	10	10			-2	2	3				15	2
KBAS	13	23			7	2	3				14	1
KBAS	14	23			-7	2	3				40	1
KBAS	15	23			10	2	3				16	2
KBAS	16	23			-10	2	3				60	2
KBAS	17	10			28	2	3				21	1
KBAS	18	6			195	2	3	-395	2	3	31	1
KBAS	19	10			18	2	3				31	1
KBAS	20	6			19	2	3	-28	2	3	17	1
KBAS	21	10			30	0	1				1	1
KBAS	22	10			29	2	3				23	2
KBAS	23	10			22	2	3				24	2
KBAS	24	10			23	2	3				1	2
KBAS	25	6			190	2	3	-390	2	3	26	1
KBAS	26	30	4		25	2	3				27	1
KBAS	27	10			26	2	3				1	1
KBAS	28	30			31	2	3				17	1
KBAS	29	49										
KBAS	30	49	1									
KBAS	31	10			18	2	3				28	1
KBAS	40	6			73	2	3	-516	2	3	41	1
KBAS	41	6			14	2	3	-40	2	3	42	1
KBAS	42	10			41	2	3				50	1
KBAS	50	6			13	2	3	-517	2	3	51	1
KBAS	51	6			50	2	3	-63	2	3	52	1
KBAS	52	10			51	2	3				8	1
KBAS	60	6			16	2	3	-518	2	3	61	2
KBAS	61	6			60	2	3	52	2	3	62	2
KBAS	62	10			61	2	3				63	2
KBAS	63	23			-62	2	3				70	2
KBAS	70	6			519	2	3	42	2	3	71	2
KBAS	71	6			15	2	3	-70	2	3	72	2
KBAS	72	10			71	2	3				73	2
KBAS	73	23			-72	2	3				9	2
KBAS	90	10			103	2	3				107	1
KBAS	91	80		1	107	2	3	-500	0	1	92	1
KBAS	92	10	7		91	2	3				93	1
KBAS	93	49	2		-92	2	3				105	1
KBAS	94	6			105	2	3	-93	2	3	95	1
KBAS	95	6			94	2	3	90	2	3	104	1
KBAS	96	10			104	2	3				108	1
KBAS	97	80		1	108	2	3	-501	0	1	98	1
KBAS	98	10	7		97	2	3				99	1
KBAS	99	49	2		-98	2	3				106	1
KBAS	100	6			106	2	3	-99	2	3	102	1
KBAS	102	6			100	2	3	96	2	3	153	1
KBAS	103	23			152	2	3				90	1
KBAS	104	23			-152	2	3				96	1
KBAS	105	10			92	2	3				94	1
KBAS	106	10			98	2	3				100	1
KBAS	107	6			90	2	3	-216	2	3	91	1
KBAS	108	6			96	2	3	-162	2	3	97	1

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

KBAS	111	75	2		-155	2	3						112	1
KBAS	112	75	2		-156	2	3						216	1
KBAS	151	10			1	2	3						152	1
KBAS	152	10			151	2	3						103	1
KBAS	153	6			95	2	3		-102	2	3		154	1
KBAS	154	10			153	2	3						155	1
KBAS	155	10			-105	2	3						156	1
KBAS	156	10			-106	2	3						163	1
KBAS	157	6			180	2	3		-158	2	3		159	1
KBAS	158	10			-179	2	3						111	1
KBAS	159	6			178	2	3		158	2	3		111	1
KBAS	160	6			111	2	3		-112	2	3		161	1
KBAS	161	6			154	2	3		-160	2	3		165	1
KBAS	162	6			133	2	3		-112	2	3		165	1
KBAS	163	10			-151	2	3						218	1
KBAS	164	6			121	2	3		-123	2	3		170	1
KBAS	165	6			154	2	3		-164	2	3		3	1
KBAS	166	6			183	2	3		-167	2	3		168	1
KBAS	167	10			186	2	3						121	1
KBAS	168	6			184	2	3		167	2	3		121	1
KBAS	170	7			121	0	1		-123	0	1		111	1
KBAS	172	10	7		-123	3	3	4					174	1
KBAS	173	10	7		170	3	3	4					177	1
KBAS	174	10	7		-121	3	3	4					176	1
KBAS	176	6			-174	3	3	4	172	3	3	4	177	1
KBAS	177	10	12		170	3	3	4		0	1		111	1
KBAS	178	6			172	3	3	4	201	2	3		180	1
KBAS	179	6			173	3	3	4	200	2	3		156	1
KBAS	180	6			174	3	3	4	199	2	3		158	1
KBAS	181	10			-22	2	3						182	1
KBAS	182	10			181	2	3						194	1
KBAS	183	6			187	2	3		182	2	3		184	1
KBAS	184	6			185	2	3		-182	2	3		121	1
KBAS	185	6			136	2	3		205	2	3		187	1
KBAS	186	6			213	2	3		206	2	3		163	1
KBAS	187	6			135	2	3		207	2	3		121	1
KBAS	188	6			213	2	3						167	1
KBAS	190	10			213	2	3						188	1
KBAS	194	10			-181	2	3						141	1
KBAS	195	6			141	2	3		-143	2	3		202	1
KBAS	197	6			-141	2	3		143	2	3		203	1
KBAS	199	10			-141	2	3						201	1
KBAS	200	10			197	2	3						203	1
KBAS	201	10			-143	2	3						202	1
KBAS	202	10			-141	2	3						204	1
KBAS	203	10			197	2	3						206	1
KBAS	204	10			-143	2	3						205	1
KBAS	205	10			204	2	3						207	1
KBAS	206	10			203	2	3						131	1
KBAS	207	10			202	2	3						131	1
KBAS	209	10			206	2	3						131	1
KBAS	213	6			131	2	3		-133	2	3		220	1
KBAS	216	6			131	2	3		-111	2	3		162	1
KBAS	217	10			218	0	1						219	1
KBAS	218	10			21	0	1						217	1
KBAS	219	10			-218	0	1						141	1
KBAS	220	30	4		213	2	3						186	1
KBAS	290	10			303	2	3						307	2
KBAS	291	80		1	307	2	3		-508	0	1		292	2
KBAS	292	10	7		291	2	3						293	2

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

KBAS 293	49	2		-292	2	3						305	2
KBAS 294	6			305	2	3		-293	2	3		295	2
KBAS 295	6			294	2	3		290	2	3		304	2
KBAS 296	10	7		304	2	3						308	2
KBAS 297	80		1	308	2	3		-509	0	1		298	2
KBAS 298	10	7		297	2	3						299	2
KBAS 299	49	2		-298	2	3						306	2
KBAS 300	6			306	2	3		-299	2	3		302	2
KBAS 302	6			300	2	3		296	2	3		353	2
KBAS 303	23			352	2	3						290	2
KBAS 304	23			-352	2	3						296	2
KBAS 305	10			292	2	3						294	2
KBAS 306	10			298	2	3						300	2
KBAS 307	6			290	2	3		-416	2	3		291	2
KBAS 308	6			296	2	3		-362	2	3		297	2
KBAS 311	75	2		-355	2	3						312	2
KBAS 312	75	2		-356	2	3						416	2
KBAS 351	10			2	2	3						352	2
KBAS 352	10			351	2	3						303	2
KBAS 353	6			295	2	3		-302	2	3		354	2
KBAS 354	10			353	2	3						355	2
KBAS 355	10			-305	2	3						356	2
KBAS 356	10			-306	2	3						363	2
KBAS 357	6			380	2	3		-358	2	3		359	2
KBAS 358	10			-379	2	3						311	2
KBAS 359	6			378	2	3		358	2	3		311	2
KBAS 360	6			311	2	3		-312	2	3		361	2
KBAS 361	6			354	2	3		-360	2	3		365	2
KBAS 362	6			333	2	3		-312	2	3		365	2
KBAS 363	10			-351	2	3						418	2
KBAS 364	6			321	2	3		-323	2	3		370	2
KBAS 365	6			354	2	3		-364	2	3		4	2
KBAS 366	6			383	2	3		-367	2	3		368	2
KBAS 367	10			386	2	3						321	2
KBAS 368	6			384	2	3		367	2	3		321	2
KBAS 370	7			321	0	1		-323	0	1		311	2
KBAS 372	10	7		-323	3	3	4					374	2
KBAS 373	10	7		370	3	3	4					377	2
KBAS 374	10	7		-321	3	3	4					376	2
KBAS 376	6			-374	3	3	4	372	3	3	4	377	2
KBAS 377	10	12		370	3	3	4		0	1		311	2
KBAS 378	6			372	3	3	4	401	2	3		380	2
KBAS 379	6			373	3	3	4	400	2	3		356	2
KBAS 380	6			374	3	3	4	399	2	3		358	2
KBAS 381	10	7		-24	2	3						382	2
KBAS 382	10	7		381	2	3						394	2
KBAS 383	6			387	2	3		382	2	3		384	2
KBAS 384	6			385	2	3		-382	2	3		321	2
KBAS 385	6			336	2	3		405	2	3		387	2
KBAS 386	6			413	2	3		406	2	3		383	2
KBAS 387	6			335	2	3		407	2	3		321	2
KBAS 388	6			413	2	3						367	2
KBAS 390	10			413	2	3						388	2
KBAS 394	10			-381	2	3						341	2
KBAS 395	6			341	2	3		-343	2	3		402	2
KBAS 397	6			-341	2	3		343	2	3		403	2
KBAS 399	10			-341	2	3						401	2
KBAS 400	10			397	2	3						403	2
KBAS 401	10			-343	2	3						402	2
KBAS 402	10			-341	2	3						404	2

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
KBAS 403     10          397 2   3                                  406    2
KBAS 404     10         -343 2   3                                  405    2
KBAS 405     10          404 2   3                                  407    2
KBAS 406     10          403 2   3                                  331    2
KBAS 407     10          402 2   3                                  331    2
KBAS 409     10          406 2   3                                  331    2
KBAS 413      6          331 2   3          -333 2    3             386    2
KBAS 416      6          331 2   3          -311 2    3             362    2
KBAS 417     10          418 0   1                                  419    2
KBAS 418     10          -21 0   1                                  417    2
KBAS 419     10         -418 0   1                                  341    2
KBAS 420     30   4      413 2   3                                  386    2
KBAS 500     49          -91 0   1
KBAS 501     49          -97 0   1
KBAS 502     49         -121 0   1
KBAS 503     49         -123 0   1
KBAS 504     49          132 0   1
KBAS 505     49          134 0   1
KBAS 506     49          142 0   1
KBAS 507     49          144 0   1
KBAS 508     49         -291 0   1
KBAS 509     49         -297 0   1
KBAS 510     49         -321 0   1
KBAS 511     49         -323 0   1
KBAS 512     49          332 0   1
KBAS 513     49          334 0   1
KBAS 514     49          342 0   1
KBAS 515     49          344 0   1
KBAS 516     49
KBAS 517     49
KBAS 518     49
KBAS 519     49
ID**    1     CABIN - SPACE STATION HABITAT
NSTR    1    151011000          0   PRI P, 5 RESETS, SPECIFY NET FLOWS
VARY    1   2                 CABIN GAS MIXTURE: INITIAL TEMPERATURE
VARY    1   3               4 TOTAL PRESSURE (PSIA)
VARY    1   6                 H2O VAPOR FLOW (LB/HR)
VARY    1  10                 OXYGEN FLOW (LBM/HR)
VARY    1  11                 NITROGEN FLOW (LBM/HR)
VARY    1  12                 CO2 FLOW (LBM/HR)
VARY    1  21                 CABIN GAS MIXTURE: INITIAL TEMPERATURE
VARY    1  22               4 TOTAL PRESSURE (PSIA)
VARY    1  25                 H2O VAPOR FLOW (LB/HR)
VARY    1  29                 OXYGEN FLOW (LBM/HR)
VARY    1  30                 NITROGEN FLOW (LBM/HR)
VARY    1  31                 CO2 FLOW (LBM/HR)
VARY    1  65                 TOTAL HEAT ADDED TO CABIN GAS MIX (BTU/HR)
VARY    1  66   6826.         NON ECLS HEAT LOAD (BTU/HR)
VARY    1  71                 HEAT LOSS DUE TO OUTBOARD LEAKAGE (BTU/HR)
VARY    1  72                 HEAT GAIN DUE TO MASS ADDITIONS (BTU/HR)
VARY    1  73                 HEAT REQD TO FLASH ENTRAINED H2O(BTU/HR)
VARY    1  74                 FLASH EVAP RATE OF ENTRAINED H2O (LBM/HR)
VARY    1  87    70.0         CABIN GAS DESIGN TEMP (DEGF)
VARY    1  88    15.0         CABIN GAS DESIGN TEMP TOL. (F)
VARY    1  89                 CABIN GAS RELATIVE HUMIDITY (DECIMAL)
VARY    1  90    14.7         DESIGN TOTAL PRESSURE (PSIA)
VARY    1  91     2.0         DESIGN TOTAL PRESSURE TOLERANCE (PSIA)
VARY    1  92     2.9         DESIGN OXYGEN PRESSURE (PSIA)
VARY    1  93     1.0         DESIGN OXYGEN PRESSURE TOL (PSIA)
VARY    1  94                 CABIN GAS OXYGEN PRESSURE (PSIA)
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

VARY	1	95		CABIN GAS NITROGEN PRESSURE (PSIA)
VARY	1	96	50.0	DESIGN DEW PT (F)
VARY	1	97	25.0	DESIGN DEW POINT TOL (F)
VARY	1	98		CABIN GAS DEW POINT
VARY	1	99	10.0	MAX ALLOWABLE CO2 PRESSURE (MM-HG)
VARY	1	100		CABIN GAS CO2 PRESSURE (MM-HG)
VARY	1	101	250.0	MAX ALLOWABLE TRACE CONTAMINENT LEVEL (PPM)
VARY	1	102		CABIN GAS TRACE CONTAMINENT LEVEL (PPM)
VARY	1	103		CABIN GAS MIXTURE, TOTAL MASS (LBM)
VARY	1	104		CABIN GAS MIXTURE, TEMPERATURE (F)
VARY	1	105		CABIN GAS MIXTURE, TOTAL PRESSURE(PSIA)
VARY	1	107		CABIN GAS MIXTURE, NON-CONDENSABLES MASS
VARY	1	108		CABIN GAS MIXTURE, H2O VAPOR MASS (LBM)
VARY	1	109		CABIN GAS MIXTURE, ENTRAINED H2O MASS (LBM)
VARY	1	110		CABIN GAS MIXTURE, NON-COND SPECIFIC HEAT
VARY	1	111		CABIN GAS MIXTURE, NON-COND MOLECULAR WT.
VARY	1	112		CABIN GAS MIXTURE, OXYGEN MASS(LBM)
VARY	1	113		CABIN GAS MIXTURE, NITROGEN MASS (LBM)
VARY	1	114		CABIN GAS MIXTURE, CO2 MASS (LBM)
VARY	1	115		CABIN GAS MIXTURE, TRACE CONTAMINENTS MASS
VARY	1	122	.104167	OUTBOARD LEAKAGE RATE (LBM/HR)
VARY	1	123		NON-CONDENSABLES LEAKAGE RATE (LBM/HR)
VARY	1	124		H2O VAPOR LEAKAGE RATE (LBM/HR)
VARY	1	125		ENTRAINED H2O LEAKAGE RATE (LBM/HR)
VARY	1	126		TOTAL MASS ADDITION RATE (LBM/HR)
VARY	1	127		NON-CONDENSABLES ADDITION RATE (LBM/HR)
VARY	1	128	0.0	H2O VAPOR ADDITION RATE (LBM/HR)
VARY	1	129	0.0	ENTRAINED H2O ADDITION RATE (LBM/HR)
VARY	1	130		AVERAGE TEMPERATURE OF MASS ADDITIONS (F)
VARY	1	132	70.0	ADD COND VAPOR TEMP (F)
VARY	1	135		NET TOTAL FLOW INTO CABIN (LBM/HR)
VARY	1	136		NET NON-COND FLOW INTO CABIN (LBM/HR)
VARY	1	137		NET H2O FLOW INTO CABIN - GPOLY CALC
VARY	1	139	10000.	CABIN FREE VOLUME (FT-3)
VARY	1	170	70.0	OXYGEN ADDITION TEMP (F)
VARY	1	171	70.0	NITROGEN ADDITION TEMP (F)
VARY	1	172	70.0	CO2 ADDITION TEMP (F)
VARY	1	173	70.0	TRACE CONTAMINENT ADDITION TEMP (F)
VARY	1	174	70.0	SPECIAL FLOW NO.1 ADDITION TEMP (F)
VARY	1	175		NET O2 ADDITION (LBM/HR)-GPOLY2 CALC
VARY	1	176		NET N2 ADDITION (LBM/HR)-GPOLY2 CALC
VARY	1	177	0.0	NET CO2 ADDITION(LBM/HR)-GPOLY2 CALC
VARY	1	178	0.0	NET TRACE CONTAMINENT ADDITION (LBM/HR)
VARY	1	179	0.0	NET SPECIAL FLOW 1 ADDITION (LBM/HR)
VARY	1	180	0.0	O2/N2 REG FLAG = 0.0 IF O2 USED LAST, = 1.0
VARY	1	181		MISSION TIME (SEC)
VARY	1	182		MISSION TIME (MIN)
ID**	2		CABIN - SPACE	STATION LABORATORY
NSTR	2		151011000	PRI P, 5 RESETS, SPECIFY NET FLOWS
VARY	2	2		CABIN GAS MIXTURE: INITIAL TEMPERATURE
VARY	2	3		4 TOTAL PRESSURE (PSIA)
VARY	2	6		H2O VAPOR FLOW (LB/HR)
VARY	2	10		OXYGEN FLOW (LBM/HR)
VARY	2	11		NITROGEN FLOW (LBM/HR)
VARY	2	12		CO2 FLOW (LBM/HR)
VARY	2	21		CABIN GAS MIXTURE: INITIAL TEMPERATURE
VARY	2	22		4 TOTAL PRESSURE (PSIA)
VARY	2	25		H2O VAPOR FLOW (LB/HR)
VARY	2	29		OXYGEN FLOW (LBM/HR)
VARY	2	30		NITROGEN FLOW (LBM/HR)

TABLE C-7 (CONTINUED)

VARY	2	31		CO2 FLOW (LBM/HR)
VARY	2	65		TOTAL HEAT ADDED TO CABIN GAS MIX (BTU/HR)
VARY	2	66	6826.	NON ECLS HEAT LOAD (BTU/HR)
VARY	2	71		HEAT LOSS DUE TO OUTBOARD LEAKAGE (BTU/HR)
VARY	2	72		HEAT GAIN DUE TO MASS ADDITIONS (BTU/HR)
VARY	2	73		HEAT REQD TO FLASH ENTRAINED H2O(BTU/HR)
VARY	2	74		FLASH EVAP RATE OF ENTRAINED H2O (LBM/HR)
VARY	2	87	70.0	CABIN GAS DESIGN TEMP (DEGF)
VARY	2	88	15.0	CABIN GAS DESIGN TEMP TOL. (F)
VARY	2	89		CABIN GAS RELATIVE HUMIDITY (DECIMAL)
VARY	2	90	14.7	DESIGN TOTAL PRESSURE (PSIA)
VARY	2	91	2.0	DESIGN TOTAL PRESSURE TOLERANCE (PSIA)
VARY	2	92	2.9	DESIGN OXYGEN PRESSURE (PSIA)
VARY	2	93	1.0	DESIGN OXYGEN PRESSURE TOL (PSIA)
VARY	2	94		CABIN GAS OXYGEN PRESSURE (PSIA)
VARY	2	95		CABIN GAS NITROGEN PRESSURE (PSIA)
VARY	2	96	50.0	DESIGN DEW PT (F)
VARY	2	97	25.0	DESIGN DEW POINT TOL (F)
VARY	2	98		CABIN GAS DEW POINT
VARY	2	99	10.0	MAX ALLOWABLE CO2 PRESSURE (MM-HG)
VARY	2	100		CABIN GAS CO2 PRESSURE (MM-HG)
VARY	2	101	250.0	MAX ALLOWABLE TRACE CONTAMINENT LEVEL (PPM)
VARY	2	102		CABIN GAS TRACE CONTAMINENT LEVEL (PPM)
VARY	2	103		CABIN GAS MIXTURE, TOTAL MASS (LBM)
VARY	2	104		CABIN GAS MIXTURE, TEMPERATURE (F)
VARY	2	105		CABIN GAS MIXTURE, TOTAL PRESSURE(PSIA)
VARY	2	107		CABIN GAS MIXTURE, NON-CONDENSABLES MASS
VARY	2	108		CABIN GAS MIXTURE, H2O VAPOR MASS (LBM)
VARY	2	109		CABIN GAS MIXTURE, ENTRAINED H2O MASS (LBM)
VARY	2	110		CABIN GAS MIXTURE, NON-COND SPECIFIC HEAT
VARY	2	111		CABIN GAS MIXTURE, NON-COND MOLECULAR WT.
VARY	2	112		CABIN GAS MIXTURE, OXYGEN MASS(LBM)
VARY	2	113		CABIN GAS MIXTURE, NITROGEN MASS (LBM)
VARY	2	114		CABIN GAS MIXTURE, CO2 MASS (LBM)
VARY	2	115		CABIN GAS MIXTURE, TRACE CONTAMINENTS MASS
VARY	2	122	.104167	OUTBOARD LEAKAGE RATE (LBM/HR)
VARY	2	123		NON-CONDENSABLES LEAKAGE RATE (LBM/HR)
VARY	2	124		H2O VAPOR LEAKAGE RATE (LBM/HR)
VARY	2	125		ENTRAINED H2O LEAKAGE RATE (LBM/HR)
VARY	2	126		TOTAL MASS ADDITION RATE (LBM/HR)
VARY	2	127		NON-CONDENSABLES ADDITION RATE (LBM/HR)
VARY	2	128	0.0	H2O VAPOR ADDITION RATE (LBM/HR)
VARY	2	129	0.0	ENTRAINED H2O ADDITION RATE (LBM/HR)
VARY	2	130		AVERAGE TEMPERATURE OF MASS ADDITIONS (F)
VARY	2	132	70.0	ADD COND VAPOR TEMP (F)
VARY	2	135		NET TOTAL FLOW INTO CABIN (LBM/HR)
VARY	2	136		NET NON-COND FLOW INTO CABIN (LBM/HR)
VARY	2	137		NET H2O FLOW INTO CABIN - GPOLY CALC
VARY	2	139	10000.	CABIN FREE VOLUME (FT-3)
VARY	2	170	70.0	OXYGEN ADDITION TEMP (F)
VARY	2	171	70.0	NITROGEN ADDITION TEMP (F)
VARY	2	172	70.0	CO2 ADDITION TEMP (F)
VARY	2	173	70.0	TRACE CONTAMINENT ADDITION TEMP (F)
VARY	2	174	70.0	SPECIAL FLOW NO.1 ADDITION TEMP (F)
VARY	2	175		NET O2 ADDITION (LBM/HR)-GPOLY2 CALC
VARY	2	176		NET N2 ADDITION (LBM/HR)-GPOLY2 CALC
VARY	2	177	0.0	NET CO2 ADDITION(LBM/HR)-GPOLY2 CALC
VARY	2	178	0.0	NET TRACE CONTAMINENT ADDITION (LBM/HR)
VARY	2	179	0.0	NET SPECIAL FLOW 1 ADDITION (LBM/HR)
VARY	2	180	0.0	O2/N2 REG FLAG = 0.0 IF O2 USED LAST, = 1.0

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TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY    2 181               MISSION TIME (SEC)
VARY    2 182               MISSION TIME (MIN)
ID**    3     SPACE STATION HABITAT CREW
NSTR    3    0               1    NO TESTS, SS CALC
KARY    3   16         4    NUMBER OF CREWMEN
VARY    3   65              TOTAL METABOLIC HEAT - ALL CREWMEN (BTU/HR)
VARY    3   66              SENSIBLE HEAT LOAD PER CREWMAN(BTU/HR)
VARY    3   67              LATENT HEAT PER CREWMAN (BTU/HR)
VARY    3   68              TOTAL OXYGEN USE RATE (LBM/HR)
VARY    3   69              TOTAL CO2 GENERATION RATE (LBM/HR)
VARY    3   70              TOTAL H2O VAPOR GENERATION RATE (LBM/HR)
VARY    3   75              INLET GAS RELATIVE HUMIDITY (DECIMAL)
VARY    3   76              INLET GAS DEW POINT (F)
VARY    3   77              OUTLET GAS RELATIVE HUMIDITY (DECIMAL)
VARY    3   78              OUTLET GAS DEW POINT (F)
VARY    3   82              TOTAL METABOLIC RATE PER CREWMAN (BTU/HR)
ID**    4     SPACE STATION LABORATORY CREW
NSTR    4    0               1    NO TESTS, SS CALC
KARY    4   16         4    NUMBER OF CREWMEN
VARY    4   65              TOTAL METABOLIC HEAT - ALL CREWMEN (BTU/HR)
VARY    4   66              SENSIBLE HEAT LOAD PER CREWMAN(BTU/HR)
VARY    4   67              LATENT HEAT PER CREWMAN (BTU/HR)
VARY    4   68              TOTAL OXYGEN USE RATE (LBM/HR)
VARY    4   69              TOTAL CO2 GENERATION RATE (LBM/HR)
VARY    4   70              TOTAL H2O VAPOR GENERATION RATE (LBM/HR)
VARY    4   75              INLET GAS RELATIVE HUMIDITY (DECIMAL)
VARY    4   76              INLET GAS DEW POINT (F)
VARY    4   77              OUTLET GAS RELATIVE HUMIDITY (DECIMAL)
VARY    4   78              OUTLET GAS DEW POINT (F)
VARY    4   82              TOTAL METABOLIC RATE PER CREWMAN (BTU/HR)
ID**    5     GAS MIXER - HABITAT AIR AND SPLIT 12
NSTR    5
ID**    6     GAS MIXER - LABORATORY AIR AND SPLIT 11
NSTR    6
ID**    7     SPLITTER - TO FAN 14 AND FAN 13
NSTR    7
VARY    7   65    0.5       FLOW FRACTION TO FAN 13 AND FAN 14
ID**    8     GAS MIXER - FROM COMP 12 AND NODE 2
NSTR    8
ID**    9     GAS MIXER - FROM COMP 11 AND NODE 4
NSTR    9
ID**   10     SPLITTER - TO FAN 14 AND FAN 15
NSTR   10
VARY   10   65    0.5       FLOW FRACTION TO FAN 14 AND FAN 15
ID**   13     FAN FOR NODAL MIXERS
NSTR   13    1                    INPUT CFM AND Q
VARY   13   76   130.0      FAN FLOW (CFM)
VARY   13   84   1.0        FAN ON/OFF SWITCH,(1.0=ON,0.0=OFF)
VARY   13   91   152.0      FAN HEAT ADDITION (WATTS)
ID**   14     FAN FOR NODAL MIXERS
NSTR   14    1
VARY   14   76   130.0      FAN FLOW (CFM)
VARY   14   84   1.0        FAN ON/OFF SWITCH (1.0=ON,0.0=OFF)
VARY   14   91   152.0      FAN HEAT ADDITION (WATTS)
ID**   15     FAN FOR NODAL MIXERS
NSTR   15    1                    INPUT CFM AND Q
VARY   15   76   130.0      FAN FLOW (CFM)
VARY   15   84   1.0        FAN ON/OFF SWITCH,(1.0=ON,0.0=OFF)
VARY   15   91   152.0      FAN HEAT ADDITION (WATTS)
ID**   16     FAN FOR NODAL MIXERS
```

II

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
NSTR  16    1
VARY  16  76    130.0       FAN FLOW (CFM)
VARY  16  84    1.0         FAN ON/OFF SWITCH (1.0=ON,0.0=OFF)
VARY  16  91    152.00      FAN HEAT ADDITION (WATTS)
ID**  17     SPLITTER - O2 BUS FLOW TO HAB AND LAB
NSTR  17
VARY  17  65    0.5         FLOW FRACTION TO HAB AND LAB
ID**  18     GAS MIXER - O2 BUS MIXER FROM ARS #1 AND #2
NSTR  18
ID**  19     SPLITTER - TO O2 STORAGE OR TO O2 BUS
NSTR  19
VARY  19  65   0.0          FLOW FRACTION TO O2 STORAGE AND BUS
ID**  20     GAS MIXER - O2 STORAGE AND RETURN O2 BUS
NSTR  20
ID**  21     SPLITTER - WATER TO ARS #1 AND ARS #2
NSTR  21
VARY  21  65   0.5          FLOW FRACTION TO ARS #1 AND ARS #2
ID**  22     SPLITTER - N2 TO ARS #1 AND SPLIT 23
NSTR  22
VARY  22  65                FLOW FRACTION TO ARS #1 AND SPLIT 23
ID**  23     SPLITTER - N2 TO HABITAT AND SPLIT 24
NSTR  23
VARY  23  65                FLOW FRACTION TO HABITAT AND SPLIT 24
ID**  24     SPLITTER - N2 TO ARS #2 AND LABORATORY
NSTR  24
VARY  24  65                  SPLIT RATIO TO ARS #2 AND LABORATORY
ID**  25     GAS MIXER - FROM ARS #1 AND ARS #2 CO2 BUS
NSTR  25
ID**  26     TANK - CO2 STORAGE ACCUMULATOR
NSTR  26    01010                 COMPUTE OUTLET FLOW IN GPOLY1
VARY  26  68                TANK MAX CAPACITY (LBM)
VARY  26  69                TANK INITIAL FILL (LBM)
VARY  26  70                TANK FLUID TEMPERATURE (F)
VARY  26  71                TANK VOLUME (FT-3)
VARY  26  72                TANK PRESSURE (PSIA)
VARY  26  92                THERMAL CAPACITANCE OF SHELL (BTU/HR)
VARY  26  94                MAX TEMP CHANGE IN ONE TIME STEP
VARY  26  98                FLUID USED FROM TANK - GPOLY2 CALC.
VARY  26  99                FLUID ADDED TO TANK - GPOLY2 CALC.
VARY  26 100                FLUID FLOW - GPOLY1 CALC.
ID**  27     SPLITTER - CO2 BUS TO ARS #1 AND ARS #2
NSTR  27
VARY  27  65                 FLOW FRACTION TO ARS #1 AND ARS #2
ID**  28      OXYGEN ACCUMULATOR
NSTR  28    01000                 FLUID TEMP EQUALS HABITAT TEMP.
VARY  28  69      79.844    TOTAL MASS OF FLUID IN TANK, LBM
VARY  28  70        70.0    FLUID TEMPERATURE IN TANK, F
VARY  28  71        13.5    TANK VOLUME, CUBIC FEET
VARY  28  72      1051.0    FLUID PRESSURE IN TANK, PSIA
VARY  28  78      79.844    MASS OF O2 IN TANK, LBM
ID**  29     ALTCOM - NITROGEN SOURCE
NSTR  29                          PASS VALUES UNCHANGED
ID**  30     ALTCOM - H2O SOURCE
NSTR  30                          PASS VALUES UNCHANGED
VARY  30   2    45.0              WATER TEMPERATURE, F
VARY  30   3    14.7      4       WATER PRESSURE, PSIA
VARY  30  67    0.0               CUMULATIVE WATER CONSUMED, LBM
ID**  31     SPLITTER - O2 FROM BUS TO STORAGE OR AIR LOCK
NSTR  31
VARY  31  65    0.0          FLOW FRACTION TO AIR LOCK AND STORAGE
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
ID**  40     GAS MIXER - NODE 1
NSTR  40
ID**  41     GAS MIXER - NODE 1
NSTR  41
ID**  42     SPLITTER - NODE 1 TO MIXER 12 AND NODE 4
NSTR  42
VARY  42  65    0.5          FLOW FRACTION TO MIXER 12 AND NODE 4(GPOLY
ID**  50     GAS MIXER - NODE 2
NSTR  50
ID**  51     GAS MIXER - NODE 2
NSTR  51
ID**  52     SPLITTER - NODE 2 TO MIXER 8 AND NODE 3
NSTR  52
VARY  52  65    0.5          FLOW FRACTION TO MIXER 8 AND NODE 3(GPOLY C
ID**  60     GAS MIXER - NODE 3
NSTR  60
ID**  61     GAS MIXER - NODE 3
NSTR  61
ID**  62     SPLITTER - NODE 3 TO MIXER 11 AND NODE 2
NSTR  62
VARY  62  65    0.5          FLOW FRACTION TO MIXER 11 AND NODE 2(GPOLY
ID**  63     FAN FOR NODAL MIXERS
NSTR  63    1
VARY  63  76    130.0        FAN FLOW (CFM)
VARY  63  84    1.0          FAN ON/OFF SWITCH (1.0=ON,0.0=OFF)
VARY  63  91    152.0        FAN HEAT ADDITION (WATTS)
ID**  70     GAS MIXER - NODE 4
NSTR  70
ID**  71     GAS MIXER - NODE 4
NSTR  71
ID**  72     SPLITTER - NODE 4 TO MIXER 9 AND NODE 1
NSTR  72
VARY  72  65    0.5          FLOW FRACTION TO MIXER 9 AND NODE 1(GPOLY C
ID**  73     FAN FOR NODAL MIXERS
NSTR  73    1
VARY  73  76    130.0        FAN FLOW (CFM)
VARY  73  84    1.0          FAN ON/OFF SWITCH (1.0=ON,0.0=OFF)
VARY  73  91    152.0        FAN HEAT ADDITION (WATTS)
ID**  90
ID**  90     ARS #1 EQUIPMENT
ID**  90
ID**  90     SPLITTER - CABIN AIR BYPASS TO HX 91 AND MIXER 95
NSTR  90
VARY  90  65    0.5          FLOW FRACTION TO BYPASS AND HX 91(GPOLY CAL
ID**  91     ARS #1 HEAT EXCHANGER #1
NSTR  91                  0
KARY  91  16          0      REDUNDANT COOLANT LOOPS? 1=YES, 0=NO
ID**  92     SPLITTER - TO WATER SEP 93
NSTR  92    10                     SPLIT RATIOS ARE INPUT
VARY  92  66    0.03         SPLIT RATIO CONDENSABLE VAPOR
VARY  92  67    1.0          SPLIT RATIO CONDENSED LIQUID
VARY  92  68    0.03         SPLIT RATIO OXYGEN
VARY  92  69    0.03         SPLIT RATIO NITROGEN
VARY  92  70    0.03         SPLIT RATIO CARBON DIOXIDE
VARY  92  71    0.03         SPLIT RATIO TRACE CONTAMINANTS
VARY  92  72    0.03         SPLIT RATIO SPECIAL FLOW #1 (HYDROGEN)
ID**  93     WATER SEPARATOR
NSTR  93    2
VARY  93  65    13.1           HEAT ADDED (BTU/HR)
VARY  93  67                   CONDENSATE REMOVED, LBM/HR  GPOLY1 CALC
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY  93  68     0.0          CUMULATIVE H2O REMOVED, LBM GPOLY1 CALC
ID**  94     GAS MIXER - FROM WATER SEP AND HEAT EXCHANGER #1
NSTR  94
ID**  95     GAS MIXER - BYPASS FLOW AND MIXER 94
NSTR  95
ID**  96     SPLITTER - CABIN AIR BYPASS TO HX 97 AND MIXER 102
NSTR  96
VARY  96  65    0.5          FLOW FRACTION TO BYPASS AND HX 97(GPOLY CAL
ID**  97     ARS #1 HEAT EXCHANGER #2
NSTR  97                      0
KARY  97  16          0      REDUNDANT COOLANT LOOPS? 1=YES, 0=NO
ID**  98     SPLITTER - TO WATER SEP 99 AND MIXER 100
NSTR  98    10                     SPLIT RATIOS ARE INPUT
VARY  98  66    0.03         SPLIT RATIO CONDENSABLE VAPOR
VARY  98  67    1.00         SPLIT RATIO CONDENSED LIQUID
VARY  98  68    0.03         SPLIT RATIO OXYGEN
VARY  98  69    0.03         SPLIT RATIO NITROGEN
VARY  98  70    0.03         SPLIT RATIO CARBON DIOXIDE
VARY  98  71    0.03         SPLIT RATIO TRACE CONTAMINANTS
VARY  98  72    0.03         SPLIT RATIO SPECIAL FLOW #1 (HYDROGEN)
ID**  99     WATER SEPARATOR
NSTR  99     2
VARY  99  65    13.1         HEAT ADDED (BTU/HR)
VARY  99  67                 CONDENSATE REMOVED, LBM/HR  GPOLY1 CALC
VARY  99  68     0.0         CUMULALATIVE H2O REMOVED, LBM GPOLY1 CALC
ID** 100     GAS MIXER - FROM WATER SEP AND HEAT EXCHANGER #1
NSTR 100
ID** 102     GAS MIXER - FROM BYPASS 96 AND MIXER 100
NSTR 102
ID** 103     FAN FOR COOLING PACKAGE #1 (ARS#1)
NSTR 103     1                     INPUT CFM AND Q
VARY 103  76    334.0       FAN FLOW (CFM)
VARY 103  84    1.0         FAN ON/OFF SWITCH,(1.0=ON,0.0=OFF)
VARY 103  91    700.0       FAN HEAT ADDITION (WATTS)
ID** 104     FAN FOR COOLING PACKAGE #2 (ARS #1)
NSTR 104     1                     INPUT CFM AND Q
VARY 104  76    334.00      FAN FLOW (CFM)
VARY 104  84    1.0         FAN ON/OFF SWITCH,(1.0=ON,0.0=OFF)
VARY 104  91    700.0       FAN HEAT ADDITION (WATTS)
ID** 105     SPLIT AIR FROM COOLING PKG 2 TO CAT.OX AND CO2 REMVL
NSTR 105
VARY 105  65    0.00        SR TO CAT.OX/CO2 REMVL AND CABIN-GPOLY CALC
ID** 106     SPLIT AIR FROM COOLING PKG 2 TO CAT.OX AND CO2 REMVL
NSTR 106
VARY 106  65    0.00        SR TO CAT.OX/CO2 REMVL AND CABIN-GPOLY CALC
ID** 107     GAS MIXER CABIN AIR AND CAT.OX/CO2 REMVL EXIT AIR
NSTR 107                      0
ID** 108     GAS MIXER CABIN AIR AND CAT.OX/CO2 REMVL EXIT AIR
NSTR 108                      0
ID** 111     CATALYTIC OXIDIZER #1
NSTR 111
VARY 111  65    28.0         CAT. OX. HEATER POWER (WATTS)
VARY 111  66    1.0          CAT. OX. EFFECTIVENESS
VARY 111  67    2.0          WGT OF HIGH TEMP CATALYST BED(LBM)
VARY 111  68    600.0        OPERATING TEMP OF HIGH TEMP CAT. BED (F)
VARY 111  69    0.1111       FRACTION OF TOTAL FLOW TO HIGH TEMP BED
ID** 112     CATALYTIC OXIDIZER #2
NSTR 112
VARY 112  65    28.0         CAT. OX. HEATER POWER (WATTS)
VARY 112  66    1.0          CAT. OX. EFFECTIVENESS
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 112  67    2.0         WGT OF HIGH TEMP CATALYST BED(LBM)
VARY 112  68    600.0       OPERATING TEMP OF HIGH TEMP CAT. BED (F)
VARY 112  69    0.1111      FRACTION OF TOTAL FLOW TO HIGH TEMP BED
ID** 151     SPLITTER - CABIN AIR TO COOLING PKG AND SPLIT 155
NSTR 151
VARY 151  65                FLOW FRACTION TO COOLING AND SLIT 155(GPOLY
ID** 152     SPLITTER - COOLING PKG FLOW TO PACKAGE #1 AND #2
NSTR 152
VARY 152  65    0.5         FLOW FRACTION TO COOLING PKG #1 AND #2
ID** 153     GAS MIXER - FROM COOLING PKG #1 AND #2
NSTR 153
ID** 154     SPLITTER - TO CABIN AIR OR ANOTHER MODULE
NSTR 154
VARY 154  65    0.0         FLOW FRACTION TO CABIN AND MODULE
ID** 155     SPLITTER - CABIN AIR TO CAT OX AND CO2 REMOVAL
NSTR 155
VARY 155  65                SPLIT RATIO CAT OX AND CO2 REMOVAL(GPOLY CA
ID** 156     SPLITTER - COOLING PKG AIR TO CAT OX AND CO2 REMVL
NSTR 156
VARY 156  65                SPLIT RATIO TO CAT OX AND CO2 REMOVAL(GPOLY
ID** 157     GAS MIXER - CAT OX PACKAGE #1
NSTR 157
ID** 158     SPLITTER - TO MIXER 157 AND MIXER 159
NSTR 158
VARY 158  65    0.5         FLOW FRACTION TO CAT OX #1 AND CAT OX #2
ID** 159     GAS MIXER - CAT OX PACKAGE #2
NSTR 159
ID** 160     GAS MIXER - CAT OX #1 AND PURGE N2
NSTR 160
ID** 161     GAS MIXER - CAT OX #2 AND PURGE N2
NSTR 161
ID** 162     GAS MIXER - CAT OX #2 AND CO2 REMOVAL #2 EXIT AIR
NSTR 162
ID** 163     SPLITTER - TO CO2 REDUCTION PACKAGE #1 AND #2
NSTR 163
VARY 163  65    0.5         FLOW FRACTION TO CO2 REDUCTION #1 AND #2
ID** 164     GAS MIXER - EXIT AIR FROM CO2 REDUCTION PKGS #1 AND #2
NSTR 164
ID** 165     GAS MIXER - MIXER 161 AND MIXER 164
NSTR 165
ID** 166     GAS MIXER - FROM MIXER 183 AND MIXER 187
NSTR 166
ID** 167     SPLITTER - TO CO2 REDUCTION PKS #1 AND #2
NSTR 167
VARY 167  65                FLOW FRACTION TO CO2 RED PKGS #1 AND #2
ID** 168     GAS MIXER - FROM MIXER 184 AND MIXER 167
NSTR 168
ID** 170     LIQ MIXER - FROM CO2 REDUCTION UNITS
NSTR 170
ID** 172     SPLITTER - TO MIXER 176 AND MIXER 178
NSTR 172
VARY 172  65                FLOW FRACTION TO MIXER 176 AND MIXER 178
ID** 173     SPLITTER - TO MIXER 179 AND SPLITTER 177
NSTR 173
VARY 173  65    1.0         FLOW FRACTION TO MIXER 179 AND SPLIT 177
ID** 174     SPLITTER TO MIXER 176 AND MIXER 180
NSTR 174
VARY 174  65                FLOW FRACTION TO MIXER 176 AND MIXER 180
ID** 176     GAS MIXER - FROM SPLIT 172 AND MIXER 174
NSTR 176
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
ID** 177     SPLITTER - TO CONDENSATE AND CH4 STORAGE
NSTR 177   1
VARY 177  66    0.0          SPLIT RATIO FOR CONDENSABLE VAPOR FLOW
VARY 177  67    1.0          SPLIT RATIO FOR CONDENSABLE LIQUID FLOW
VARY 177  68    0.0          SPLIT RATIO FOR OXYGEN FLOW
VARY 177  69    0.0          SPLIT RATIO FOR NITROGEN FLOW
VARY 177  70    0.0          SPLIT RATIO FOR CARBON DIOXIDE FLOW
VARY 177  71    0.0          SPLIT RATIO FOR TRACE CONTAMINANT FLOW
VARY 177  72    0.0          SPLIT RATIO FOR SPECIAL FLOW #1, H2
VARY 177  73    0.0          SPLIT RATIO FOR SPECIAL FLOW #2, CH4
ID** 178     GAS MIXER - FROM SPLIT 172 AND SPLIT 201
NSTR 178
ID** 179     GAS MIXER - FROM SPLIT 173 AND SPLIT 200
NSTR 179
ID** 180     GAS MIXER - FROM SPLIT 199 AND SPLIT 174
NSTR 180
ID** 181     SPLITTER - N2 TO SPLIT 182 AND TO SPLIT 194
NSTR 181
VARY 181  65                 FLOW FRACTION TO SPLIT 182 AND SPLIT 194
ID** 182     SPLITTER - NITROGEN TO MIXER 183 AND MIXER 184
NSTR 182
VARY 182  65                 FLOW FRACTION TO MIXER 183 AND MIXER 184
ID** 183     GAS MIXER - N2 FROM MIXER 187 AND SPLIT 182
NSTR 183
ID** 184     GAS MIXER - N2 FROM MIXER 185 AND SPLIT 182
NSTR 184
ID** 185     GAS MIXER - CO2 FROM CO2 REM. PKG #2 AND H2 FROM SPLIT 205
NSTR 185
ID** 186     GAS MIXER - FROM CO2 ACCUMULATOR AND H2 FROM SPLIT 206
NSTR 186
ID** 187     GAS MIXER - CO2 FROM SPLIT 131 AND H2 FROM SPLIT 207
NSTR 187
ID** 188     GAS MIXER - CO2 FROM CO2 BUS AND SPLIT 190
NSTR 188
ID** 190     SPLITTER - CO2 TO MIXER 188 AND CO2 BUS
NSTR 190
VARY 190  65                 FLOW FRACTION TO MIXER 188 AND CO2 BUS
ID** 194     SPLITTER - N2 TO O2 GEN PKG #1 AND PKG #2
NSTR 194
VARY 194  65                 FLOW FRACTION TO O2 GEN PKG #1 AND #2
ID** 195     GAS MIXER - O2 FROM O2 GEN PKG #1 AND #2
NSTR 195
ID** 197     GAS MIXER - H2 OR N2 FROM O2 GEN PKGS #1 AND #2
NSTR 197
ID** 199     SPLITTER - N2 TO MIXER 180 OR H2 TO SPLIT 202
NSTR 199
VARY 199  65                 FLOW FRACTION TO MIXER 180 OR SPLIT 202
ID** 200     SPLITTER - N2 TO MIXER 179 OR H2 TO SPLIT 203
NSTR 200
VARY 200  65                 FLOW FRACTION TO MIXER 179 OR SPLIT 203
ID** 201     SPLITTER - N2 TO MIXER 178 OR H2 TO SPLIT 204
NSTR 201
VARY 201  65                 FLOW FRACTION TO MIXER 178 OR SPLIT 204
ID** 202     SPLITTER - H2 TO VENT AND SPLIT 207
NSTR 202
VARY 202  65    0.0          FLOW FRACTION TO VENT AND SPLIT 207
ID** 203     SPLITTER - H2 TO VENT AND SPLIT 206
NSTR 203
VARY 203  65                 FLOW FRACTION TO VENT AND SPLIT 206
ID** 204     SPLITTER - H2 TO VENT AND SPLIT 205
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
NSTR 204
VARY 204  65    0.0          FLOW FRACTION TO VENT AND SPLIT 206
ID** 205     SPLITTER - H2 TO CO2 REDUCTION AND CO2 REMOVAL
NSTR 205
VARY 205  65      1.0        SPLIT RATIO CO2 RED AND CO2 REMOVAL(GPOLY C
ID** 206     SPLITTER - H2 TO CO2 REDUCTION AND CO2 REMOVAL
NSTR 206
VARY 206  65                 FLOW FRACTION TO CO2 RED AND CO2 REMOVAL
ID** 207     SPLITTER - H2 TO CO2 REDUCTION AND CO2 REMOVAL
NSTR 207
VARY 207  65      1.0        SPLIT RATIO CO2 RED AND CO2 REMOVAL(GPOLY C
ID** 209     SPLITTER - H2 TO CO2 REMOVAL PKG #1 AND #2
NSTR 209
VARY 209  65                 FLOW FRACTION TO CO2 REMOVAL PKG #1 AND #2
ID** 213     GAS MIXER - CO2 FROM CO2 REMOVAL PKGS #1 AND #2
NSTR 213
ID** 216     GAS MIXER - CABIN AIR AND CO2 REMOVAL EXIT
NSTR 216
ID** 217     SPLITTER - H20 TO O2 GENERATION PKG #1 AND #2
NSTR 217
VARY 217  65    0.5          FLOW FRACTION TO O2 GEN PKG #1 AND #2
ID** 218     SPLITTER - H20 TO O2 GENERATION AND CO2 REMOVAL
NSTR 218
VARY 218  65    0.0          FLOW TO O2 GENERATION AND CO2 REMOVAL
ID** 219     SPLITTER - H2O TO CO2 REMOVAL PKG #1 AND #2
NSTR 219
VARY 219  65    0.5          FLOW FRACTION TO CO2 REMOVAL #1 AND #2
ID** 220     TANK - CO2 STORAGE ACCUMULATOR
NSTR 220     01010                COMPUTE OUTLET FLOW IN GPOLY1
VARY 220  68                 TANK MAX CAPACITY (LBM)
VARY 220  69                 TANK INITIAL FILL (LBM)
VARY 220  70                 TANK FLUID TEMPERATURE (F)
VARY 220  71                 TANK VOLUME (FT-3)
VARY 220  72                 TANK PRESSURE (PSIA)
VARY 220  92                 THERMAL CAPACITANCE OF SHELL (BTU/HR)
VARY 220  94                 MAX TEMP CHANGE IN ONE TIME STEP
VARY 220  98                 FLUID USED FROM TANK - GPOLY2 CALC.
VARY 220  99                 FLUID ADDED TO TANK - GPOLY2 CALC.
VARY 220 100                 FLUID FLOW - GPOLY1 CALC.
ID** 290
ID** 290     ARS #2 EQUIPMENT
ID** 290
ID** 290     SPLITTER - CABIN AIR BYPASS TO HX 291 AND MIXER 295
NSTR 290
VARY 290  65    0.500        SPLIT RATIO BYPASS AND HX 291-GPOLY CALC
ID** 291     ARS #2 HEAT EXCHANGER #1
NSTR 291                     0
KARY 291  16          0      REDUNDANT COOLANT LOOPS? 1=YES, 0=NO
ID** 292     SPLITTER - TO WATER SEP 293
NSTR 292     10                   SPLIT RATIOS ARE INPUT
VARY 292  66    0.030        SPLIT RATIO WATER VAPOR
VARY 292  67    1.000        SPLIT RATIO CONDENSED WATER
VARY 292  68    0.030        SPLIT RATIO OXYGEN
VARY 292  69    0.030        SPLIT RATIO NITROGEN
VARY 292  70    0.030        SPLIT RATIO CARBON DIOXIDE
VARY 292  71    0.030        SPLIT RATIO TRACE CONTAMINANTS
VARY 292  72    0.030        SPLIT RATIO HYDROGEN
ID** 293     WATER SEPARATOR
NSTR 293     2
VARY 293  65    13.10        WATER SEPARATOR HEAT LOAD (BTU/HR)
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 293  67                    CONDENSATE REMOVED, PPH  GPOLY1 CALC
VARY 293  68     0.00           CUCMULATIVE H2O REMOVED, LBM  GPOLY1 CALC
ID** 294     GAS MIXER - FROM WATER SEP AND HEAT EXCHANGER #1
NSTR 294
ID** 295     GAS MIXER - BYPASS FLOW AND MIXER 294
NSTR 295
ID** 296     SPLITTER - CABIN AIR BYPASS TO HX 297 AND MIXER 302
NSTR 296
VARY 296  65    0.500           SPLIT RATIO BYPASS AND HX 297-GPOLY CALC
ID** 297     ARS #2 HEAT EXCHANGER #2
NSTR 297                        0
KARY 297  16         0          REDUNDANT COOLANT LOOPS? 1=YES, 0=NO
ID** 298     SPLITTER - TO WATER SEP 299
NSTR 298    10                            SPLIT RATIOS ARE INPUT
VARY 298  66    0.030           SPLIT RATIO WATER VAPOR
VARY 298  67    1.000           SPLIT RATIO CONDENSED WATER
VARY 298  68    0.030           SPLIT RATIO OXYGEN
VARY 298  69    0.030           SPLIT RATIO NITROGEN
VARY 298  70    0.030           SPLIT RATIO CARBON DIOXIDE
VARY 298  71    0.030           SPLIT RATIO TRACE CONTAMINANTS
VARY 298  72    0.030           SPLIT RATIO HYDROGEN
ID** 299     WATER SEPARATOR
NSTR 299     2
VARY 299  65    13.10           WATER SEPARATOR HEAT LOAD (BTU/HR)
VARY 299  67                    CONDENSATE REMOVED, PPH  GPOLY1 CALC
VARY 299  68     0.0            CUMULATIVE H2O REMOVED, LBM  GPOLY1 CALC
ID** 300     GAS MIXER - FROM WATER SEP AND HEAT EXCHANGER #1
NSTR 300
ID** 302     GAS MIXER - FROM BYPASS 296 AND MIXER 300
NSTR 302
ID** 303     FAN FOR COOLING PACKAGE #1 (ARS#2)
NSTR 303     1                            INPUT CFM AND Q
VARY 303  76    334.0           FAN FLOW (CFM)
VARY 303  84    1.0             FAN ON/OFF SWITCH,(1.0=ON,0.0=OFF)
VARY 303  91    700.00          FAN HEAT ADDITION (WATTS)
ID** 304     FAN FOR COOLING PACKAGE #2 (ARS #2)
NSTR 304     1                            INPUT CFM AND Q
VARY 304  76    334.00          FAN FLOW (CFM)
VARY 304  84    1.0             FAN ON/OFF SWITCH,(1.0=ON,0.0=OFF)
VARY 304  91    700.00          FAN HEAT ADDITION (WATTS)
ID** 305     SPLIT AIR FROM COOLING PKG 2 TO CAT.OX AND CO2 REMVL
NSTR 305
VARY 305  65    0.00            SR TO CAT.OX/CO2 REMVL AND CABIN-GPOLY CALC
ID** 306     SPLIT AIR FROM COOLING PKG 2 TO CAT.OX AND CO2 REMVL
NSTR 306
VARY 306  65    0.00            SR TO CAT.OX/CO2 REMVL AND CABIN-GPOLY CALC
ID** 307     GAS MIXER CABIN AIR AND CAT.OX/CO2 REMVL EXIT AIR
NSTR 307
ID** 308     GAS MIXER CABIN AIR AND CAT.OX/CO2 REMVL EXIT AIR
NSTR 308
ID** 311     CATALYTIC OXIDIZER #1
NSTR 311
VARY 311  65    28.00           CAT. OX. HEATER POWER (WATTS)
VARY 311  66    1.00            CAT. OX. EFFECTIVENESS
VARY 311  67    2.00            WGT OF HIGH TEMP CATALYST BED(LBM)
VARY 311  68    600.0           OPERATING TEMP OF HIGH TEMP CAT. BED (F)
VARY 311  69    0.1111          FRACTION OF TOTAL FLOW TO HIGH TEMP BED
ID** 312     CATALYTIC OXIDIZER #2
NSTR 312
VARY 312  65    28.00           CAT. OX. HEATER POWER (WATTS)
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 312  66    1.00          CAT. OX. EFFECTIVENESS
VARY 312  67    2.00          WGT OF HIGH TEMP CATALYST BED(LBM)
VARY 312  68    600.0         OPERATING TEMP OF HIGH TEMP CAT. BED (F)
VARY 312  69    0.1111        FRACTION OF TOTAL FLOW TO HIGH TEMP BED
ID** 351     SPLITTER - CABIN AIR TO COOLING PKG AND SPLIT 355
NSTR 351
VARY 351  65                  SPLIT RATIO COOLING AND SPLIT 355-GPOLY CAL
ID** 352     SPLITTER - COOLING PKG FLOW TO PACKAGE #1 AND #2
NSTR 352
VARY 352  65    0.5           FLOW FRACTION TO COOLING PKG #1 AND #2
ID** 353     GAS MIXER - FROM COOLING PKG #1 AND #2
NSTR 353
ID** 354     SPLITTER - TO CABIN AIR OR ANOTHER MODULE
NSTR 354
VARY 354  65    0.0           FLOW FRACTION TO CABIN AND MODULE
ID** 355     SPLITTER - COOLING PKG AIR TO CAT OX AND CO2 REMOVAL (PKG 1
NSTR 355
VARY 355  65                  SPLIT RATIO CAT OX AND CO2 REMOVAL-GPOLY CA
ID** 356     SPLITTER - COOLING PKG AIR TO CAT OX AND CO2 REMOVAL  (PKG
NSTR 356
VARY 356  65                  SPLIT RATIO TO CAT OX AND CO2 REM #2-GPOLY
ID** 357     GAS MIXER - CAT OX PACKAGE #1
NSTR 357
ID** 358     SPLITTER - TO MIXER 357 AND MIXER 359
NSTR 358
VARY 358  65    0.5           FLOW FRACTION TO CAT OX #1 AND CAT OX #2
ID** 359     GAS MIXER - CAT OX PACKAGE #2
NSTR 359
ID** 360     GAS MIXER - CAT OX #1 EXIT AIR AND PURGE N2
NSTR 360
ID** 361     GAS MIXER - CAT OX #2 EXIT AIR AND PURGE N2
NSTR 361
ID** 362     GAS MIXER- CAT OX #2 EXIT AND CO2 REMOVAL #2 EXIT
NSTR 362
ID** 363     SPLITTER - TO CO2 REDUCTION PACKAGE #1 AND #2
NSTR 363
VARY 363  65    0.500         FLOW FRACTION TO CO2 REDUCTION #1 AND #2
ID** 364     GAS MIXER - EXIT AIR FROM CO2 REDUCTION PKGS #1 AND #2
NSTR 364
ID** 365     GAS MIXER - MIXER 361 AND MIXER 364
NSTR 365
ID** 366     GAS MIXER - FROM MIXER 383 AND MIXER 387
NSTR 366
ID** 367     SPLITTER - TO CO2 REDUCTION PKS #1 AND #2
NSTR 367
VARY 367  65                  FLOW FRACTION TO CO2 RED PKGS #1 AND #2
ID** 368     GAS MIXER - FROM MIXER 384 AND MIXER 367
NSTR 368
ID** 370     GAS MIXER - CO2 REDUCTION PKGS #1 AND #2
NSTR 370
ID** 372     SPLITTER - TO MIXER 376 AND MIXER 378
NSTR 372
VARY 372  65                  FLOW FRACTION TO MIXER 376 AND MIXER 378
ID** 373     SPLITTER - TO MIXER 379 AND SPLITTER 377
NSTR 373
VARY 373  65    1.0           FLOW FRACTION TO MIXER 379 AND SPLIT 377
ID** 374     SPLITTER TO MIXER 376 AND MIXER 380
NSTR 374
VARY 374  65                  FLOW FRACTION TO MIXER 376 AND MIXER 380
ID** 376     GAS MIXER - FROM SPLIT 372 AND MIXER 374
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
NSTR 376
ID** 377      SPLITTER - TO CONDENSATE AND CH4 STORAGE
NSTR 377     1
VARY 377  66    0.0          SPLIT RATIO FOR CONDENSABLE VAPOR FLOW
VARY 377  67    1.0          SPLIT RATIO FOR CONDENSABLE LIQUID FLOW
VARY 377  68    0.0          SPLIT RATIO FOR OXYGEN FLOW
VARY 377  69    0.0          SPLIT RATIO FOR NITROGEN FLOW
VARY 377  70    0.0          SPLIT RATIO FOR CARBON DIOXIDE FLOW
VARY 377  71    0.0          SPLIT RATIO FOR TRACE CONTAMINENT FLOW
VARY 377  72    0.0          SPLIT RATIO FOR SPECIAL FLOW #1, H2
VARY 377  73    0.0          SPLIT RATIO FOR SPECIAL FLOW #2, CH4
ID** 378      GAS MIXER - FROM SPLIT 372 AND SPLIT 401
NSTR 378
ID** 379      GAS MIXER - FROM SPLIT 373 AND SPLIT 400
NSTR 379
ID** 380      GAS MIXER - FROM SPLIT 399 AND SPLIT 374
NSTR 380
ID** 381      SPLITTER - N2 TO SPLIT 382 AND TO SPLIT 394
NSTR 381
VARY 381  65                 FLOW FRACTION TO SPLIT 382 AND SPLIT 394
ID** 382      SPLITTER - NITROGEN TO MIXER 383 AND MIXER 384
NSTR 382
VARY 382  65                 FLOW FRACTION TO MIXER 383 AND MIXER 384
ID** 383      GAS MIXER - N2 FROM MIXER 387 AND SPLIT 382
NSTR 383
ID** 384      GAS MIXER - N2 FROM MIXER 185 AND SPLIT 182
NSTR 384
ID** 385      GAS MIXER - CO2 FROM SPLIT 391 AND H2 FROM SPLIT 405
NSTR 385
ID** 386      GAS MIXER - FROM CO2 ACCUMULATOR AND H2 FROM SPLIT 406
NSTR 386
ID** 387      GAS MIXER - CO2 FROM CO2 REM PKG #1 AND H2 FROM SPLIT 407
NSTR 387
ID** 388      GAS MIXER - CO2 FROM CO2 BUS AND SPLIT 390
NSTR 388
ID** 390      SPLITTER - CO2 TO MIXER 388 AND CO2 BUS
NSTR 390
VARY 390  65                 FLOW FRACTION TO MIXER 388 AND CO2 BUS
ID** 394      SPLITTER - N2 TO O2 GEN PKG #1 AND PKG #2
NSTR 394
VARY 394  65                 FLOW FRACTION TO O2 GEN PKG #1 AND #2
ID** 395      GAS MIXER - O2 FROM O2 GEN PKG #1 AND #2
NSTR 395
ID** 397      GAS MIXER - H2 OR N2 FROM O2 GEN PKG #1 AND #2
NSTR 397
ID** 399      SPLITTER - N2 TO MIXER 380 OR H2 TO SPLIT 402
NSTR 399
VARY 399  65                 FLOW FRACTION TO MIXER 380 OR SPLIT 402
ID** 400      SPLITTER - N2 TO MIXER 379 OR H2 TO SPLIT 403
NSTR 400
VARY 400  65                 FLOW FRACTION TO MIXER 379 OR SPLIT 403
ID** 401      SPLITTER - N2 TO MIXER 378 OR H2 TO SPLIT 404
NSTR 401
VARY 401  65                 FLOW FRACTION TO MIXER 378 OR SPLIT 404
ID** 402      SPLITTER - H2 TO VENT AND SPLIT 407
NSTR 402
VARY 402  65    0.0          FLOW FRACTION TO VENT AND SPLIT 407
ID** 403      SPLITTER - H2 TO VENT AND SPLIT 406
NSTR 403
VARY 403  65                .FLOW FRACTION TO VENT AND SPLIT 406
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
ID** 404     SPLITTER - H2 TO VENT AND SPLIT 405
NSTR 404
VARY 404  65    0.0         FLOW FRACTION TO VENT AND SPLIT 406
ID** 405     SPLITTER - H2 TO CO2 REDUCTION AND CO2 REMOVAL
NSTR 405
VARY 405  65    1.0         SPLIT RATIO CO2 RED AND CO2 REM-GPOLY CALC
ID** 406     SPLITTER - H2 TO CO2 REDUCTION AND CO2 REMOVAL
NSTR 406
VARY 406  65                FLOW FRACTION TO CO2 RED AND CO2 REMOVAL
ID** 407     SPLITTER - H2 TO CO2 REDUCTION AND CO2 REMOVAL
NSTR 407
VARY 407  65    1.0         SPLIT RATIO CO2 RED AND CO2 REM-GPLOY CALC
ID** 409     SPLITTER - H2 OR  H2O TO CO2 REMOVAL PKG #1 AND #2
NSTR 409
VARY 409  65                FLOW FRACTION TO CO2 REMOVAL PKG #1 AND #2
ID** 413     GAS MIXER - CO2 FROM CO2 REMOVAL PKG #1 AND #2
NSTR 413
ID** 416     GAS MIXER - CABIN AIR AND CO2 REMOVAL EXIT
NSTR 416
ID** 417     SPLITTER - H2O TO O2 GENERATION PKG #1 AND #2
NSTR 417
VARY 417  65    0.5         FLOW FRACTION TO O2 GEN PKG #1 AND #2
ID** 418     SPLITTER - H2O TO O2 GENERATION AND CO2 REMOVAL
NSTR 418
VARY 418  65    0.0         FLOW TO O2 GENERATION AND CO2 REMOVAL
ID** 419     SPLITTER - H2O TO CO2 REMOVAL PKG #1 AND #2
NSTR 419
VARY 419  65    0.0         FLOW FRACTION TO CO2 REMOVAL #1 AND #2
ID** 420     TANK - CO2 STORAGE ACCUMULATOR
NSTR 420     01010                COMPUTE OUTLET FLOW IN GPOLY1
VARY 420  68                TANK MAX CAPACITY (LBM)
VARY 420  69                TANK INITIAL FILL (LBM)
VARY 420  70                TANK FLUID TEMPERATURE (F)
VARY 420  71                TANK VOLUME (FT-3)
VARY 420  72                TANK PRESSURE (PSIA)
VARY 420  92                THERMAL CAPACITANCE OF SHELL (BTU/HR)
VARY 420  94                MAX TEMP CHANGE IN ONE TIME STEP
VARY 420  98                FLUID USED FROM TANK - GPOLY2 CALC.
VARY 420  99                FLUID ADDED TO TANK - GPOLY2 CALC.
VARY 420 100                FLUID FLOW - GPOLY1 CALC.
ID** 500     BOUNDARY: ARS #1 HEAT EXCHANGER #1 COOLANT
NSTR 500
VARY 500   1    497.00      COOLANT FLOW (LBM/HR)
VARY 500   2     40.00      COOLANT TEMP (F)
VARY 500   3     50.00    4 COOLANT PRESSURE (PSIA)
ID** 501     BOUNDARY: ARS #1 HEAT EXCHANGER #2 COOLANT
NSTR 501
VARY 501   1    497.00      COOLANT FLOW (LBM/HR)
VARY 501   2     40.00      COOLANT TEMP (F)
VARY 501   3     50.00    4 COOLANT PRESSURE (PSIA)
ID** 502     BOUNDARY: ARS #1 CO2 REDUCTION #1 COOLANT
NSTR 502
VARY 502   1      60.0      COOLANT FLOW (LBM/HR)
VARY 502   2     38.00      COOLANT TEMP (F)
VARY 502   3     50.00    4 COOLANT PRESSURE (PSIA)
ID** 503     BOUNDARY: ARS #1 CO2 REDUCTION #2 COOLANT
NSTR 503
VARY 503   1      60.0      COOLANT FLOW (LBM/HR)
VARY 503   2     38.00      COOLANT TEMP (F)
VARY 503   3     50.00    4 COOLANT PRESSURE (PSIA)
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
ID** 504     BOUNDARY: ARS #1 CO2 REMOVAL #1 COOLANT
NSTR 504
VARY 504   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 504   2    45.00        COOLANT TEMP (F)
VARY 504   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 505     BOUNDARY: ARS #1 CO2 REMOVAL #2 COOLANT
NSTR 505
VARY 505   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 505   2    45.00        COOLANT TEMP (F)
VARY 505   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 506     BOUNDARY: ARS #1 O2 GENERATION #1 COOLANT
NSTR 506
VARY 506   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 506   2    45.00        COOLANT TEMP (F)
VARY 506   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 507     BOUNDARY: ARS #1 O2 GENERATION #2 COOLANT
NSTR 507
VARY 507   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 507   2    45.00        COOLANT TEMP (F)
VARY 507   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 508     BOUNDARY: ARS #2 HEAT EXCHANGER #1 COOLANT
NSTR 508
VARY 508   1    497.0        COOLANT FLOW (LBM/HR)
VARY 508   2    40.00        COOLANT TEMP (F)
VARY 508   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 509     BOUNDARY: ARS #2 HEAT EXCHANGER #2 COOLANT
NSTR 509
VARY 509   1    497.0        COOLANT FLOW (LBM/HR)
VARY 509   2    40.00        COOLANT TEMP (F)
VARY 509   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 510     BOUNDARY: ARS #2 CO2 REDUCTION #1 COOLANT
NSTR 510
VARY 510   1      60.0       COOLANT FLOW (LBM/HR)
VARY 510   2    38.00        COOLANT TEMP (F)
VARY 510   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 511     BOUNDARY: ARS #2 CO2 REDUCTION #2 COOLANT
NSTR 511
VARY 511   1      60.0       COOLANT FLOW (LBM/HR)
VARY 511   2    38.00        COOLANT TEMP (F)
VARY 511   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 512     BOUNDARY: ARS #2 CO2 REMOVAL #1 COOLANT
NSTR 512
VARY 512   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 512   2    45.00        COOLANT TEMP (F)
VARY 512   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 513     BOUNDARY: ARS #2 CO2 REMOVAL #2 COOLANT
NSTR 513
VARY 513   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 513   2    45.00        COOLANT TEMP (F)
VARY 513   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 514     BOUNDARY: ARS #2 O2 GENERATION #1 COOLANT
NSTR 514
VARY 514   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 514   2    45.00        COOLANT TEMP (F)
VARY 514   3    50.00      4 COOLANT PRESSURE (PSIA)
ID** 515     BOUNDARY: ARS #2 O2 GENERATION #2 COOLANT
NSTR 515
VARY 515   1    5005.0       COOLANT FLOW (LBM/HR)
VARY 515   2    45.00        COOLANT TEMP (F)
VARY 515   3    50.00      4 COOLANT PRESSURE (PSIA)
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
ID** 516      BOUNDARY: NODE #1 INLET BOUNDARY FLOW
NSTR 516
ID** 517      BOUNDARY: NODE #2 INLET BOUNDARY FLOW
NSTR 517
ID** 518      BOUNDARY: NODE #3 INLET BOUNDARY FLOW
NSTR 518
ID** 519      BOUNDARY: NODE #4 INLET BOUNDARY FLOW
NSTR 519
ID** 540      ***********************************************************
ID** 540      *                                                         *
ID** 540      *                  LIBRARY OF SUBSYSTEMS                  *
ID** 540      *                                                         *
ID** 540      ***********************************************************
ID** 540
ID** 540
ID** 540      -------- CO2 REDUCTION SUBSYSTEMS #1 FOR ARS #1 ----------
ID** 540
ID** 540      SABATIER
KBAS 540      78  4      187 3   3 4          -163 3   3 4          123    1
NSTR 540
VARY 540  65                   HEATER POWER, NORMAL (WATTS)
VARY 540  66                   HEATER POWER, STATUP (WATTS)
VARY 540  67                   WATER CONDENSED (LBM/HR)
VARY 540  68                   METHANE EXIT FLOW (LBM/HR)
ID** 121      BOSCH
KBAS 121      83  1  0   187 0   1            -502 0   1            123    1
NSTR 121     1
VARY 121  65      40.000       MAX. CARBON LOADING FOR CARTRIDGE, LBM
VARY 121  66       0.163       DRY BASIS VOL FRAC OF CO2 IN COMP EXIT GASES
VARY 121  67       0.327       DRY BASIS VOL FRAC OF H2 IN COMP EXIT GASES
VARY 121  68       0.235       DRY BASIS VOL FRAC OF CH4 IN COMP EXIT GASES
VARY 121  69       0.275       DRY BASIS VOL FRAC OF CO IN COMP EXIT GASES
VARY 121  70       0.900       EFFECTIVENESS FACTOR FOR CONDENSER
VARY 121  71       0.850       EFFECTIVENESS FACTOR FOR REGEN HX
VARY 121  73      24.300       REACTOR PRESSURE, PSIA
VARY 121  74      16.900       CONDENSER PRESSURE, PSIA
VARY 121  76       1.000       AERODYNAMIC EFFICIENCY OF COMPRESSOR
VARY 121  77       0.250       MOTOR EFFICIENCY OF COMPRESSOR
VARY 121  78    1230.000       DESIRED REACTOR TEMPERATURE, F
VARY 121  79       6.800       RECYCLE FLOW RATE, PPH
VARY 121 101       6.600       LUMPED THERMAL MASS OF REACTOR, BTU/F
ID** 542      -------- CO2 REDUCTION SUBSYSTEMS #2 FOR ARS #1 ----------
ID** 542      SABATIER
KBAS 542      78  4      185 3   3 4           163 3   3 4          164    1
NSTR 542
VARY 542  65                   HEATER POWER, NORMAL (WATTS)
VARY 542  66                   HEATER POWER,STARTUP (WATTS)
VARY 542  67                   WATER CONDENSED (LBM/HR)
VARY 542  68                   METHANE EXIT FLOW (LBM/HR)
ID** 123      BOSCH
KBAS 123      83  1  0   185 0   1            -503 0   1            170    1
NSTR 123     1
VARY 123  65      40.000       MAX. CARBON LOADING FOR CARTRIDGE, LBM
VARY 123  66       0.163       DRY BASIS VOL FRAC OF CO2 IN COMP EXIT GASES
VARY 123  67       0.327       DRY BASIS VOL FRAC OF H2 IN COMP EXIT GASES
VARY 123  68       0.235       DRY BASIS VOL FRAC OF CH4 IN COMP EXIT GASES
VARY 123  69       0.275       DRY BASIS VOL FRAC OF CO IN COMP EXIT GASES
VARY 123  70       0.900       EFFECTIVENESS FACTOR FOR CONDENSER
VARY 123  71       0.850       EFFECTIVENESS FACTOR FOR REGEN HX
VARY 123  73      24.300       REACTOR PRESSURE, PSIA
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 123  74      16.900     CONDENSER PRESSURE, PSIA
VARY 123  76       1.000     AERODYNAMIC EFFICIENCY OF COMPRESSOR
VARY 123  77       0.250     MOTOR EFFICIENCY OF COMPRESSOR
VARY 123  78    1230.000     DESIRED REACTOR TEMPERATURE, F
VARY 123  79       6.800     RECYCLE FLOW RATE, PPH
VARY 123 101       6.600     LUMPED THERMAL MASS OF REACTOR, BTU/F
ID** 550
ID** 550     -------- CO2 REMOVAL SUBSYSTEMS #1 FOR ARS #1 ------------
ID** 550
ID** 550     EDC                                                       132    1
KBAS 550     76  6       155 2   3              -207 2   3
NSTR 550
KARY 550  16           30    NUMBER OF CELLS
VARY 550  65                 HEAT TO BE REMOVED BY EDC HEX (BTU/HR)
VARY 550  68                 ACTUAL CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 550  69  11.00          DESIGN CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 550  70  3.00           DESIGN PCO2 (MMHG)
VARY 550  71  0.001736       CO2 TRANSFER RATE (LBM-CO2/AMP-HR)
VARY 550  72  0.5            UNIT CELL AREA (SQ-FT/CELL)
VARY 550  73  70.00          CELL OPERATING TEMP (F)
VARY 550  74  14.7           CELL OPERATING PRESSURE (PSIA)
VARY 550  75                 MASS FLOW OF WATER PRODUCED (LBM/HR)
VARY 550  76                 CURRENT GENERATED (AMP)
VARY 550  77                 POWER GENERATED (WATTS)
VARY 550  78                 O2 CONSUMED (LBM/HR)
VARY 550  79                 CO2 REMOVED (LBM/HR)
VARY 550  80      0.03       H2 CONSUMED (LBM/HR)
ID** 551     SAWD                                                      133    1
KBAS 551     73          155 2   3              -219 2   3
NSTR 551
ID** 131     MOLECULAR SIEVE                          2   3            133    1
KBAS 131     84 40       155 2   3
NSTR 131                         0
VARY 131  65         60.0    HALF CYCLE TIME, MINUTES
VARY 131  66          1.0    MIN PRESS OF DESORBING MOLE SIEVE BED, PSIA
VARY 131  67         20.0    CO2 ACCUMULATOR PRESSURE, PSIA
VARY 131  68        360.0    MAX TEMP OF DESRB MOL SIEVE BED, F
VARY 131  69        180.0    MAX TEMP OF DESRB SILICA GEL BED, F
VARY 131  70         70.0    CABIN AIR TEMPERATURE, F
VARY 131  71          1.0    FIRST TIME INTO COMPONENT: 1=TRUE, 0=FALSE
VARY 131  72                 HALF CYCLE TIME, SECONDS
VARY 131  73                 FULL CYCLE TIME, SECONDS
VARY 131  74                 COMPUTATION TIME STEP, HOURS
VARY 131  75          1.0    FIRST HALF OF CYCLE: 1=TRUE, 0=FALSE
VARY 131  76         45.0    HX COOLANT INLET TEMPERATURE, F
VARY 131  81                 COMPRESSOR POWER, BTU/HR
VARY 131  82                 FAN POWER, BTU/HR
VARY 131  83                 HEAT GIVEN TO DESRB SILICA GEL BED, BTU/HR
VARY 131  84                 HEAT REMOVED BY THE HEAT EXCHANGER, BTU/HR
VARY 131  85                 AVG Q FROM DSRBNG SIL GEL TO CABIN, BTU/HR
VARY 131  86                 AVG Q FROM DSRBNG MOL SIV TO CABIN, BTU/HR
VARY 131  90          0.0    H2O ADSORBED IN SIL GEL BED #1, LBM
VARY 131  91          0.0    H2O ADSORBED IN SIL GEL BED #2, LBM
VARY 131  92          0.0    CO2 ADSORBED IN MOL SIV BED #1, LBM
VARY 131  93          0.0    CO2 ADSORBED IN MOL SIV BED #2, LBM
VARY 131  94          0.0    H2O ADSORBED IN PRESENT SIL GEL BED, LBM
VARY 131  95          0.0    CO2 ADSORBED IN PRESENT MOL SIV BED, LBM
VARY 131  96          0.0    H2O DESORBED IN PRESENT SIL GEL BED, LBM
VARY 131  97          0.0    H2O DESORBED IN PRESENT MOL SIV BED, LBM
VARY 131  98          0.0    H2O ADSORBED LAST CYCLE, LBM
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 131  99        0.0      CO2 ADSORBED LAST CYCLE, LBM
VARY 131 100                 CYCLE CURRENTLY RUNNING
VARY 131 101                 FAN EXIT TEMPERATURE, F
VARY 131 102                 ADSORBING SIL GEL BED EXIT TEMP, F
VARY 131 103                 ADSORBING MOL SIV BED EXIT TEMP, F
VARY 131 104                 DESORBING SIL GEL BED EXIT TEMP, F
ID** 132     EDC HEAT EXCHANGER
KBAS 132     49  1      504 0   1                                   133     1
NSTR 132    2
VARY 132  65    944.0        HEAT LOAD FROM EDC OR MOL SIEVE (BTU/HR)
ID** 553
ID** 553       ------ CO2 REMOVAL SYSTEMS #2 FOR ARS #1 --------------
ID** 553
ID** 553          EDC
KBAS 553     76  6      156 2   3              -205 2   3           134     1
NSTR 553
KARY 553  16          30     NUMBER OF CELLS
VARY 553  65                 HEAT TO BE REMOVED BY EDC HEX (BTU/HR)
VARY 553  68                 ACTUAL CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 553  69  11.00          DESIGN CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 553  70   3.00          DESIGN PCO2 (MMHG)
VARY 553  71  0.001736       CO2 TRANSFER RATE (LBM-CO2/AMP-HR)
VARY 553  72  0.5            UNIT CELL AREA (SQ-FT/CELL)
VARY 553  73  70.00          CELL OPERATING TEMP (F)
VARY 553  74  14.7           CELL OPERATING PRESSURE (PSIA)
VARY 553  75                 MASS FLOW OF WATER PRODUCED (LBM/HR)
VARY 553  76                 CURRENT GENERATED (AMP)
VARY 553  77                 POWER GENERATED (WATTS)
VARY 553  78                 O2 CONSUMED (LBM/HR)
VARY 553  79                 CO2 REMOVED (LBM/HR)
VARY 553  80    0.03         H2 CONSUMED (LBM/HR)
ID** 554          SAWD
KBAS 554     73         156 2   3               219 2   3           135     1
NSTR 554
ID** 133          MOLECULAR SIEVE
KBAS 133     84 40      156 2   3                 2   3             135     1
NSTR 133                       0
VARY 133  65       60.0      HALF CYCLE TIME, MINUTES
VARY 133  66        1.0      MIN PRESS OF DESORBING MOLE SIEVE BED, PSIA
VARY 133  67       20.0      CO2 ACCUMULATOR PRESSURE, PSIA
VARY 133  68      360.0      MAX TEMP OF DESRB MOL SIEVE BED, F
VARY 133  69      180.0      MAX TEMP OF DESRB SILICA GEL BED, F
VARY 133  70       70.0      CABIN AIR TEMPERATURE, F
VARY 133  71        1.0      FIRST TIME INTO COMPONENT: 1=TRUE, 0=FALSE
VARY 133  72                 HALF CYCLE TIME, SECONDS
VARY 133  73                 FULL CYCLE TIME, SECONDS
VARY 133  74                 COMPUTATION TIME STEP, HOURS
VARY 133  75        1.0      FIRST HALF OF CYCLE: 1=TRUE, 0=FALSE
VARY 133  76       45.0      HX COOLANT INLET TEMPERATURE, F
VARY 133  81                 COMPRESSOR POWER, BTU/HR
VARY 133  82                 FAN POWER, BTU/HR
VARY 133  83                 HEAT GIVEN TO DESRB SILICA GEL BED, BTU/HR
VARY 133  84                 HEAT REMOVED BY THE HEAT EXCHANGER, BTU/HR
VARY 133  85                 AVG Q FROM DSRBNG SIL GEL TO CABIN, BTU/HR
VARY 133  86                 AVG Q FROM DSRBNG MOL SIV TO CABIN, BTU/HR
VARY 133  90        0.0      H2O ADSORBED IN SIL GEL BED #1, LBM
VARY 133  91        0.0      H2O ADSORBED IN SIL GEL BED #2, LBM
VARY 133  92        0.0      CO2 ADSORBED IN MOL SIV BED #1, LBM
VARY 133  93        0.0      CO2 ADSORBED IN MOL SIV BED #2, LBM
VARY 133  94        0.0      H2O ADSORBED IN PRESENT SIL GEL BED, LBM
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 133  95         0.0     CO2 ADSORBED IN PRESENT MOL SIV BED, LBM
VARY 133  96         0.0     H2O DESORBED IN PRESENT SIL GEL BED, LBM
VARY 133  97         0.0     H2O DESORBED IN PRESENT MOL SIV BED, LBM
VARY 133  98         0.0     H2O ADSORBED LAST CYCLE, LBM
VARY 133  99         0.0     CO2 ADSORBED LAST CYCLE, LBM
VARY 133 100                 CYCLE CURRENTLY RUNNING
VARY 133 101                 FAN EXIT TEMPERATURE, F
VARY 133 102                 ADSORBING SIL GEL BED EXIT TEMP, F
VARY 133 103                 ADSORBING MOL SIV BED EXIT TEMP, F
VARY 133 104                 DESORBING SIL GEL BED EXIT TEMP, F
ID** 134      EDC HEAT EXCHANGER
KBAS 134      49  1      505 0   1                                     135     1
NSTR 134     2
VARY 134  65     944.0       HEAT LOAD FROM EDC OR MOL SIEVE (BTU/HR)
ID** 135      ACCUMULATOR FOR CO2 REMOVAL UNIT #1 IN ARS #1
KBAS 135      30          -131 2   3                                   136     1
NSTR 135     00000                 FLUID TEMP EQUALS INLET TEMP.
VARY 135  69        1.10     TOTAL MASS OF FLUID IN TANK, LBM
VARY 135  70        70.0     FLUID TEMPERATURE IN TANK, F
VARY 135  71        4.75     TANK VOLUME, CUBIC FEET
VARY 135  72        30.0     FLUID PRESSURE IN TANK, PSIA
VARY 135  80        1.10     MASS OF CO2 IN TANK, LBM
ID** 136      ACCUMULATOR FOR CO2 REMOVAL UNIT #2 IN ARS #1
KBAS 136      30          -133 2   3                                   185     1
NSTR 136     00000                 FLUID TEMP EQUALS INLET TEMP.
VARY 136  69        1.10     TOTAL MASS OF FLUID IN TANK, LBM
VARY 136  70        70.0     FLUID TEMPERATURE IN TANK, F
VARY 136  71        4.75     TANK VOLUME, CUBIC FEET
VARY 136  72        30.0     FLUID PRESSURE IN TANK, PSIA
VARY 136  80        1.10     MASS OF CO2 IN TANK, LBM
ID** 141
ID** 141     ---------- O2 GENERATION  SUBSYSTEMS #1 FOR ARS #1 --------
ID** 141
ID** 141          STATIC FEED SOLID POLYMER ELECTROLYSIS
KBAS 141      77  2      217 2   3                 2   3               142     1
NSTR 141
KARY 141  16           1     LIGHTSIDE/CONTINUOUS = 1, DARKSIDE =0
KARY 141  17          20     NUMBER OF CELLS
VARY 141  65                 TOTAL HEAT TO BE REMOVED BY SPE HX (BTU/HR)
VARY 141  66                 O2 FLOW RATE TO CABIN (LBM/HR)
VARY 141  67                 SPE WATER DEMAND (LBM/HR)
VARY 141  68                 WATER VAPOR FLOW TO CABIN (LBM/HR)
VARY 141  69                 CELL CURRENT (AMPS) - GPOLY CALC.
VARY 141  70     200.0       CELL OPERATING PRESSURE (PSIA)
VARY 141  71     155.0       CELL OPERATING TEMP (F)
VARY 141  72     29.33       NOMINAL CELL CURRENT (AMP/CELL)
ID** 561          KOH ELECTROLYSIS
KBAS 561      85         217 0   1                                     142     1
NSTR 561
ID** 142      O2 GENERATION HEAT EXCHANGER FOR SYSTEM #1
KBAS 142      49  1      506 0   1                                     143     1
NSTR 142     2
VARY 142  65                 HEAT LOAD ELEC CELLS (BTU/HR) GPOLY1 CALC
ID** 143     -------- O2 GENERATION  SUBSYSTEMS #2 FOR ARS #1 ----------
ID** 143
ID** 143          STATIC FEED SOLID POLYMER ELECTROLYSIS
KBAS 143      77  2     -217 2   3                 2   3               144     1
NSTR 143
KARY 143  16           1     LIGHTSIDE CONTINUOUS=1,DARKSIDE =0
KARY 143  17          20     NUMBER OF CELLS
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 143  65                 TOTAL HEAT TO BE REMOVED BY SPE HX (BTU/HR)
VARY 143  66                 O2 FLOW RATE TO CABIN (LBM/HR)
VARY 143  67                 SPE WATER DEMAND (LBM/HR)
VARY 143  68                 WATER VAPOR FLOW TO CABIN (LBM/HR)
VARY 143  69                 CELL CURRENT (AMPS) - GPOLY CALC.
VARY 143  70    200.0        CELL OPERATING PRESSURE (PSIA)
VARY 143  71    155.0        CELL OPERATING TEMP (F)
VARY 143  72    29.33        NOMINAL CELL CURRENT (AMP/CELL)
ID** 563          KOH ELECTROLYSIS
KBAS 563     85         -217 0   1                                144    1
NSTR 563
ID** 144       O2 GENERATION HEAT EXCHANGER FOR SYSTEM #2
KBAS 144     49  1       507 0   1                                195    1
NSTR 144    2
VARY 144  65                 HEAT LOAD ELEC CELLS (BTU/HR) GPOLY1 CALC
ID** 570
ID** 570
ID** 570
ID** 570    --------- CO2 REDUCTION SUBSYSTEM #1 FOR ARS #2 -----------
ID** 570          SABATIER
KBAS 570     78  4       387 3   3 4          -363 3   3 4        323    2
NSTR 570
VARY 570  65                 HEATER POWER, NORMAL (WATTS)
VARY 570  66                 HEATER POWER,STARTUP (WATTS)
VARY 570  67                 WATER CONDENSED (LBM/HR)
VARY 570  68                 METHANE EXIT FLOW (LBM/HR)
ID** 321          BOSCH
KBAS 321     83  1       387 0   1            -510 0   1          323    2
NSTR 321    1
VARY 321  65     40.000      MAX. CARBON LOADING FOR CARTRIDGE, LBM
VARY 321  66      0.163      DRY BASIS VOL FRAC OF CO2 IN COMP EXIT GASES
VARY 321  67      0.327      DRY BASIS VOL FRAC OF H2 IN COMP EXIT GASES
VARY 321  68      0.235      DRY BASIS VOL FRAC OF CH4 IN COMP EXIT GASES
VARY 321  69      0.275      DRY BASIS VOL FRAC OF CO IN COMP EXIT GASES
VARY 321  70      0.900      EFFECTIVENESS FACTOR FOR CONDENSER
VARY 321  71      0.850      EFFECTIVENESS FACTOR FOR REGEN HX
VARY 321  73     24.300      REACTOR PRESSURE, PSIA
VARY 321  74     16.900      CONDENSER PRESSURE, PSIA
VARY 321  76      1.000      AERODYNAMIC EFFICIENCY OF COMPRESSOR
VARY 321  77      0.250      MOTOR EFFICIENCY OF COMPRESSOR
VARY 321  78   1230.000      DESIRED REACTOR TEMPERATURE, F
VARY 321  79      6.800      RECYCLE FLOW RATE, PPH
VARY 321 101      6.600      LUMPED THERMAL MASS OF REACTOR, BTU/F
ID** 572       CO2 REDUCTION SUBSYSTEM #2 FOR ARS #2
ID** 572          SABATIER
KBAS 572     78  4       385 3   3 4           363 3   3 4        364    2
NSTR 572
VARY 572  65                 HEATER POWER, NORMAL (WATTS)
VARY 572  66                 HEATER POWER,STARTUP (WATTS)
VARY 572  67                 WATER CONDENSED (LBM/HR)
VARY 572  68                 METHANE EXIT FLOW (LBM/HR)
ID** 323          BOSCH
KBAS 323     83 18       385 0   1            -511 0   1          370    2
NSTR 323    1
VARY 323  65     40.000      MAX. CARBON LOADING FOR CARTRIDGE, LBM
VARY 323  66      0.163      DRY BASIS VOL FRAC OF CO2 IN COMP EXIT GASES
VARY 323  67      0.327      DRY BASIS VOL FRAC OF H2 IN COMP EXIT GASES
VARY 323  68      0.235      DRY BASIS VOL FRAC OF CH4 IN COMP EXIT GASES
VARY 323  69      0.275      DRY BASIS VOL FRAC OF CO IN COMP EXIT GASES
VARY 323  70      0.900      EFFECTIVENESS FACTOR FOR CONDENSER
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 323  71       0.850     EFFECTIVENESS FACTOR FOR REGEN HX
VARY 323  73      24.300     REACTOR PRESSURE, PSIA
VARY 323  74      16.900     CONDENSER PRESSURE, PSIA
VARY 323  76       1.000     AERODYNAMIC EFFICIENCY OF COMPRESSOR
VARY 323  77       0.250     MOTOR EFFICIENCY OF COMPRESSOR
VARY 323  78    1230.000     DESIRED REACTOR TEMPERATURE, F
VARY 323  79       6.800     RECYCLE FLOW RATE, PPH
VARY 323 101       6.600     LUMPED THERMAL MASS OF REACTOR, BTU/F
ID** 580
ID** 580      CO2 REMOVAL SYSTEMS #1 FOR ARS #2************************
ID** 580
ID** 580          EDC CO2 REMOVAL SUBSYSTEM
KBAS 580     76  6      355 2   3           -407 2   3            332     2
NSTR 580
KARY 580  16          30     NUMBER OF CELLS
VARY 580  65                 HEAT TO BE REMOVED BY EDC HEX (BTU/HR)
VARY 580  68                 ACTUAL CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 580  69  11.00          DESIGN CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 580  70  3.00           DESIGN PCO2 (MMHG)
VARY 580  71  0.001736       CO2 TRANSFER RATE (LBM-CO2/AMP-HR)
VARY 580  72  0.50           UNIT CELL AREA (SQ-FT/CELL)
VARY 580  73  70.0           CELL OPERATING TEMP (F)
VARY 580  74  14.7           CELL OPERATING PRESSURE (PSIA)
VARY 580  75                 MASS FLOW OF WATER PRODUCED (LBM/HR)
VARY 580  76                 CURRENT GENERATED (AMP)
VARY 580  77                 POWER GENERATED (WATTS)
VARY 580  78                 O2 CONSUMED (LBM/HR)
VARY 580  79                 CO2 REMOVED (LBM/HR)
VARY 580  80    0.03         H2 CONSUMED (LBM/HR)
ID** 581          SAWD CO2 REMOVAL SUBSYSTEM
KBAS 581     73         355 2   3           -419 2   3            333     2
NSTR 581
ID** 331          MOL SIEVE
KBAS 331     84 40      355 2   3                  2   3          333     2
NSTR 331
VARY 331  65        60.0     HALF CYCLE TIME, MINUTES
VARY 331  66         1.0     MIN PRESS OF DESORBING MOLE SIEVE BED, PSIA
VARY 331  67        20.0     CO2 ACCUMULATOR PRESSURE, PSIA
VARY 331  68       360.0     MAX TEMP OF DESRB MOL SIEVE BED, F
VARY 331  69       180.0     MAX TEMP OF DESRB SILICA GEL BED, F
VARY 331  70        70.0     CABIN AIR TEMPERATURE, F
VARY 331  71         1.0     FIRST TIME INTO COMPONENT: 1=TRUE, 0=FALSE
VARY 331  72                 HALF CYCLE TIME, SECONDS
VARY 331  73                 FULL CYCLE TIME, SECONDS
VARY 331  74                 COMPUTATION TIME STEP, HOURS
VARY 331  75         1.0     FIRST HALF OF CYCLE: 1=TRUE, 0=FALSE
VARY 331  76        45.0     HX COOLANT INLET TEMPERATURE, F
VARY 331  81                 COMPRESSOR POWER, BTU/HR
VARY 331  82                 FAN POWER, BTU/HR
VARY 331  83                 HEAT GIVEN TO DESRB SILICA GEL BED, BTU/HR
VARY 331  84                 HEAT REMOVED BY THE HEAT EXCHANGER, BTU/HR
VARY 331  85                 AVG Q FROM DSRBNG SIL GEL TO CABIN, BTU/HR
VARY 331  86                 AVG Q FROM DSRBNG MOL SIV TO CABIN, BTU/HR
VARY 331  90         0.0     H2O ADSORBED IN SIL GEL BED #1, LBM
VARY 331  91         0.0     H2O ADSORBED IN SIL GEL BED #2, LBM
VARY 331  92         0.0     CO2 ADSORBED IN MOL SIV BED #1, LBM
VARY 331  93         0.0     CO2 ADSORBED IN MOL SIV BED #2, LBM
VARY 331  94         0.0     H2O ADSORBED IN PRESENT SIL GEL BED, LBM
VARY 331  95         0.0     CO2 ADSORBED IN PRESENT MOL SIV BED, LBM
VARY 331  96         0.0     H2O DESORBED IN PRESENT SIL GEL BED, LBM
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 331  97        0.0      H2O DESORBED IN PRESENT MOL SIV BED, LBM
VARY 331  98        0.0      H2O ADSORBED LAST CYCLE, LBM
VARY 331  99        0.0      CO2 ADSORBED LAST CYCLE, LBM
VARY 331 100                 CYCLE CURRENTLY RUNNING
VARY 331 101                 FAN EXIT TEMPERATURE, F
VARY 331 102                 ADSORBING SIL GEL BED EXIT TEMP, F
VARY 331 103                 ADSORBING MOL SIV BED EXIT TEMP, F
VARY 331 104                 DESORBING SIL GEL BED EXIT TEMP, F
ID** 332      EDC/MOL SIEVE HEAT EXCHANGER FOR SYSTEM #1
KBAS 332     49  1       512 0   1                                  333    2
NSTR 332    2
VARY 332  65     944.0       HEAT LOAD FROM EDC OR MOL SIEVE (BTU/HR)
ID** 583
ID** 583      CO2 REMOVAL SYSTEMS #2 FOR ARS #2************************
ID** 583
ID** 583          EDC CO2 REMOVAL SUBSYSTEM
KBAS 583     76  6       356 2   3             -405 2   3           334    2
NSTR 583
KARY 583  16          30     NUMBER OF CELLS
VARY 583  65                 HEAT TO BE REMOVED BY EDC HEX (BTU/HR)
VARY 583  68                 ACTUAL CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 583  69  11.00          DESIGN CELL CURRENT DENSITY (AMP/SQ-FT)
VARY 583  70  3.00           DESIGN PCO2 (MMHG)
VARY 583  71  0.001736       CO2 TRANSFER RATE (LBM-CO2/AMP-HR)
VARY 583  72  0.5            UNIT CELL AREA (SQ-FT/CELL)
VARY 583  73  70.00          CELL OPERATING TEMP (F)
VARY 583  74  14.7           CELL OPERATING PRESSURE (PSIA)
VARY 583  75                 MASS FLOW OF WATER PRODUCED (LBM/HR)
VARY 583  76                 CURRENT GENERATED (AMP)
VARY 583  77                 POWER GENERATED (WATTS)
VARY 583  78                 O2 CONSUMED (LBM/HR)
VARY 583  79                 CO2 REMOVED (LBM/HR)
VARY 583  80  0.03           H2 CONSUMED (LBM/HR)
ID** 584          SAWD CO2 REMOVAL SUBSYSTEM
KBAS 584     73          356 2   3              419 2   3           385    2
NSTR 584
ID** 333          MOL SIEVE CO2 REMOVAL SUBSYSTEM
KBAS 333     84 40       356 2   3                  2   3           335    2
NSTR 333
VARY 333  65       60.0      HALF CYCLE TIME, MINUTES
VARY 333  66        1.0      MIN PRESS OF DESORBING MOLE SIEVE BED, PSIA
VARY 333  67       20.0      CO2 ACCUMULATOR PRESSURE, PSIA
VARY 333  68      360.0      MAX TEMP OF DESRB MOL SIEVE BED, F
VARY 333  69      180.0      MAX TEMP OF DESRB SILICA GEL BED, F
VARY 333  70       70.0      CABIN AIR TEMPERATURE, F
VARY 333  71        1.0      FIRST TIME INTO COMPONENT: 1=TRUE, 0=FALSE
VARY 333  72                 HALF CYCLE TIME, SECONDS
VARY 333  73                 FULL CYCLE TIME, SECONDS
VARY 333  74                 COMPUTATION TIME STEP, HOURS
VARY 333  75        1.0      FIRST HALF OF CYCLE: 1=TRUE, 0=FALSE
VARY 333  76       45.0      HX COOLANT INLET TEMPERATURE, F
VARY 333  81                 COMPRESSOR POWER, BTU/HR
VARY 333  82                 FAN POWER, BTU/HR
VARY 333  83                 HEAT GIVEN TO DESRB SILICA GEL BED, BTU/HR
VARY 333  84                 HEAT REMOVED BY THE HEAT EXCHANGER, BTU/HR
VARY 333  85                 AVG Q FROM DSRBNG SIL GEL TO CABIN, BTU/HR
VARY 333  86                 AVG Q FROM DSRBNG MOL SIV TO CABIN, BTU/HR
VARY 333  90        0.0      H2O ADSORBED IN SIL GEL BED #1, LBM
VARY 333  91        0.0      H2O ADSORBED IN SIL GEL BED #2, LBM
VARY 333  92        0.0      CO2 ADSORBED IN MOL SIV BED #1, LBM
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
VARY 333  93         0.0     CO2 ADSORBED IN MOL SIV BED #2, LBM
VARY 333  94         0.0     H2O ADSORBED IN PRESENT SIL GEL BED, LBM
VARY 333  95         0.0     CO2 ADSORBED IN PRESENT MOL SIV BED, LBM
VARY 333  96         0.0     H2O DESORBED IN PRESENT SIL GEL BED, LBM
VARY 333  97         0.0     H2O DESORBED IN PRESENT MOL SIV BED, LBM
VARY 333  98         0.0     H2O ADSORBED LAST CYCLE, LBM
VARY 333  99         0.0     CO2 ADSORBED LAST CYCLE, LBM
VARY 333 100                 CYCLE CURRENTLY RUNNING
VARY 333 101                 FAN EXIT TEMPERATURE, F
VARY 333 102                 ADSORBING SIL GEL BED EXIT TEMP, F
VARY 333 103                 ADSORBING MOL SIV BED EXIT TEMP, F
VARY 333 104                 DESORBING SIL GEL BED EXIT TEMP, F
ID** 334      EDC HEAT EXCHANGER FOR SYSYEM #2
KBAS 334     49  1      513 0   1                                   385    2
NSTR 334    2
VARY 334  65    944.0       HEAT LOAD FROM EDC OR MOL SIEVE (BTU/HR)
ID** 335      ACCUMULATOR FOR CO2 REMOVAL UNIT #1 IN ARS #2
KBAS 335     30         -331 2   3                                  336    2
NSTR 335    00000                     FLUID TEMP EQUALS INLET TEMP.
VARY 335  69        1.10     TOTAL MASS OF FLUID IN TANK, LBM
VARY 335  70        70.0     FLUID TEMPERATURE IN TANK, F
VARY 335  71        4.75     TANK VOLUME, CUBIC FEET
VARY 335  72        30.0     FLUID PRESSURE IN TANK, PSIA
VARY 335  80        1.10     MASS OF CO2 IN TANK, LBM
ID** 336      ACCUMULATOR FOR CO2 REMOVAL UNIT #2 IN ARS #2
KBAS 336     30         -333 2   3                                  385    2
NSTR 336    00000                     FLUID TEMP EQUALS INLET TEMP.
VARY 336  69        1.10     TOTAL MASS OF FLUID IN TANK, LBM
VARY 336  70        70.0     FLUID TEMPERATURE IN TANK, F
VARY 336  71        4.75     TANK VOLUME, CUBIC FEET
VARY 336  72        30.0     FLUID PRESSURE IN TANK, PSIA
VARY 336  80        1.10     MASS OF CO2 IN TANK, LBM
ID** 341
ID** 341      O2 GENERATION  SYSTEM #1 FOR ARS #2**********************
ID** 341
ID** 341           STATIC FEED SOLID POLYMER ELECTROLYSIS
KBAS 341     77  2      417 2   3                    2   3          342    2
NSTR 341
KARY 341  16           1     LIGHTSIDE CONTINUOUS=1,DARKSIDE =0
KARY 341  17          20     NUMBER OF CELLS
VARY 341  65                 TOTAL HEAT TO BE REMOVED BY SPE HX (BTU/HR)
VARY 341  66                 O2 FLOW RATE TO CABIN (LBM/HR)
VARY 341  67                 SPE WATER DEMAND (LBM/HR)
VARY 341  68                 WATER VAPOR FLOW TO CABIN (LBM/HR)
VARY 341  69                 CELL CURRENT (AMPS) - GPOLY CALC.
VARY 341  70    200.0        CELL OPERATING PRESSURE (PSIA)
VARY 341  71    155.0        CELL OPERATING TEMP (F)
VARY 341  72    29.33        NOMINAL CELL CURRENT (AMP/CELL)
ID** 591           KOH ELECTROLYSIS SUBSYSTEM
KBAS 591     85         417 0   1                                   342    2
NSTR 591
ID** 342      O2 GENERATION HEAT EXCHANGER FOR SYSTEM #1
KBAS 342     49  1      514 0   1                                   343    2
NSTR 342    2
VARY 342  65                 HEAT LOAD ELECT CELLS (BTU/HR) GPOLY1 CALC
ID** 343      O2 GENERATION  SYSTEM #2 FOR ARS #2**********************
ID** 343
ID** 343           STATIC FEED SOLID POLYMER ELECTROLYSIS
KBAS 343     77  2     -417 2   3                    2   3          344    2
NSTR 343
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
KARY 343  16          1      LIGHTSIDE CONTINUOUS=1,DARKSIDE =0
KARY 343  17         20      NUMBER OF CELLS
VARY 343  65                 TOTAL HEAT TO BE REMOVED BY SPE HX (BTU/HR)
VARY 343  66                 O2 FLOW RATE TO CABIN (LBM/HR)
VARY 343  67                 SPE WATER DEMAND (LBM/HR)
VARY 343  68                 WATER VAPOR FLOW TO CABIN (LBM/HR)
VARY 343  69                 CELL CURRENT (AMPS) - GPOLY CALC.
VARY 343  70    200.0        CELL OPERATING PRESSURE (PSIA)
VARY 343  71    155.0        CELL OPERATING TEMP (F)
VARY 343  72    29.33        NOMINAL CELL CURRENT (AMP/CELL)
ID** 593          KOH ELECTROLYSIS SUBSYSTEM
KBAS 593     85        -417 0   1                                     344     2
NSTR 593
ID** 344      O2 GENERATION HEAT EXCHANGER FOR SYSTEM #2
KBAS 344     49  1       515 0   1                                     395     2
NSTR 344     2
VARY 344  65                 HEAT LOAD ELEC CELLS (BTU/HR) GPOLY1 CALC
TABL   1  1     2          14     0     LIN   LIN
TITL   1  2 CREWMAN METABOLIC RATE (BTU/HR) VS MISSION TIME (SEC)
VALU   1 10 2I  0.0        24300.     28800.     42300.     43200.     46800.
VALU   1 11 2D  300.0      300.0      633.4      633.4      450.0      450.
VALU   1 12 2I  54000.     61200.     64800.     68400.     72000.     77400.
VALU   1 13 2D  633.4      633.4      450.0      450.0      550.0      550.
VALU   1 14 2I  83700.     86400.
VALU   1 15 2D  300.0      300.0
TABL   2  1     2           8           LIN   LIN
TITL   2  2  PRESSURE CONTROL SUBSYSTEM REGULATOR FLOWRATE CURVE
TITL   2  3 N2 OPENING FLOWS (FROM JULY 1980 PCS TESTING AT JSC)
TITL   2  4 N2 OPENING FLOWS VS TOTAL PRESSURE (PSIA)
VALU   2 10 2I      0.0    14.500     14.510      14.563     14.583     14.640
VALU   2 11 2D     67.0      67.0      25.0          7.0        1.0        0.5
VALU   2 12 2I  14.748      100.0
VALU   2 13 2D      0.0       0.0
TABL   3  1     2           8           LIN   LIN
TITL   3  2  PRESSURE CONTROL SUBSYSTEM REGULATOR FLOWRATE CURVE
TITL   3  3 N2 CLOSING FLOWS (FROM JULY 1980 PCS TESTING AT JSC)
TITL   3  4 N2 CLOSING FLOWS VS TOTAL PRESSURE (PSIA)
VALU   3 10 2I      0.0    14.590     14.625      14.658     14.680     14.748
VALU   3 11 2D     67.0      67.0      11.0          7.0        0.8        0.5
VALU   3 12 2I  14.813      100.0
VALU   3 13 2D      0.0       0.0
TABL   4  1     3           3    14    LIN   LIN   LIN
TITL   4  2  CREWMAN LATENT LOAD (BTU/MAN-HR) VS TIME (SEC) AND TEMP (F)
VALU   4 10 3I             0.0        24300.     28800.     42300.     43200.
VALU   4 11 3D  65.0       70.0       70.0       253.375    253.375    90.0
VALU   4 12 3D  70.0       70.0       70.0       305.0      305.0      135.0
VALU   4 13 3D  75.0       70.0       70.0       363.375    363.375    180.0
VALU   4 14 3I             46800.     54000.     61200.     64800.     68400.
VALU   4 15 3D  65.0       90.0       253.375    253.375    90.0       90.0
VALU   4 16 3D  70.0       135.0      305.0      305.0      135.0      135.0
VALU   4 17 3D  75.0       180.0      363.375    363.375    180.0      180.0
VALU   4 18 3I             72000.     77400.     83700.     86400.
VALU   4 19 3D  65.0       175.0      175.0      70.0       70.0
VALU   4 20 3D  70.0       225.0      225.0      70.0       70.0
VALU   4 21 3D  75.0       280.0      280.0      70.0       70.0
TABL   5  1     2           4           LIN   STP
TITL   5  2  NUMBER OF PEOPLE IN HABITAT VS. TIME, SECONDS
VALU   5 10 2I  0.0        28800.     79200.     86400.
VALU   5 11 2D  8.0        8.0        8.0        8.0
TABL   6  1     2           4           LIN   STP
```

TABLE C-7 (CONTINUED)

INPUT DATA FOR SPACE STATION MODEL

```
TITL   6  2  NUMBER OF PEOPLE IN LABORATORY VS. TIME, SECONDS
VALU   6 10 2I  0.0        28800.      79200.      86400.
VALU   6 11 2D  0.0        0.0         0.0         0.0
TABL   7  1    2           6           LIN   LIN
TITL   7  2  PRESSURE CONTROL SUBSYSTEM REGULATOR FLOWRATE CURVE
TITL   7  3 O2 OPENING FLOWS (FROM JULY 1980 PCS TESTING AT JSC)
TITL   7  4 O2 OPENING FLOWS VS TOTAL PRESSURE (PSIA)
VALU   7 10 2I     0.0      14.510      14.565      14.666      14.700     100.000
VALU   7 11 2D    10.0       10.0        0.85         0.2         0.0         0.0
TABL   8  1    2           6           LIN   LIN
TITL   8  2  PRESSURE CONTROL SUBSYSTEM REGULATOR FLOWRATE CURVE
TITL   8  3 O2 CLOSING FLOWS (FROM JULY 1980 PCS TESTING AT JSC)
TITL   8  4 O2 CLOSING FLOWS VS TOTAL PRESSURE (PSIA)
VALU   8 10 2I     0.0      14.605      14.672      14.745      14.819     100.000
VALU   8 11 2D    10.0       10.0         0.6        0.25         0.0         0.0
PLOT0
PLOT2      1   2                        HABITAT TEMPERATURE (F)
PLOT2      1   4                        HABITAT PRESSURE (PSIA)
PLOT2      1  94                        HABITAT O2 PRESSURE (PSIA)
PLOT2      1  98                        HABITAT DEW POINT (F)
PLOT2      1 100                        HABITAT CO2 PRESSURE (MMHG)
PLOT2      2   2                        LABORATORY TEMPERATURE (F)
PLOT2      2   4                        LABORATORY PRESSURE (PSIA)
PLOT2      2  94                        LABORATORY O2 PRESSURE (PSIA)
PLOT2      2  98                        LABORATORY DEW POINT (F)
PLOT2      2 100                        LABORATORY CO2 PRESSURE (MMHG)
PLOT2     28  72                        O2 ACCUMULATOR PRESSURE (PSIA)
PLOT2    131   1                        HAB. CO2 SUB #1 ACCUM. INLET FLOW (PPH)
PLOT2    131  87                        CO2 REMOVED BY HAB. SUBSYSTEM #1 (PPH)
PLOT2    135   1                        HAB. SUB. #1 CO2 ACCUM EXIT FLOW (PPH)
PLOT2    135  72                        CO2 ACCUM. PRESSURE (HAB. SUB. #1) (PSIA)
PLOT2    141  10                        O2 PRODUCED BY HAB. O2 GEN #1 (PPH)
PLOT2    141  14                        H2 GEN FROM HAB. O2 GEN #1 (PPH)
PLOT2    202  33                        H2 VENTED FROM HAB. O2 GEN #1 (PPH)
PLOT2    207  33                        H2 TO CO2 RED. FROM HAB O2 GEN #1 (PPH)
PLOT2    331   1                        LAB. CO2 SUB #1 ACCUM. INLET FLOW (PPH)
PLOT2    331  87                        CO2 REMOVED BY LAB. SUBSYSTEM #1 (PPH)
PLOT2    335   1                        LAB. SUB. #1 CO2 ACCUM EXIT FLOW (PPH)
PLOT2    335  72                        CO2 ACCUM. PRESSURE(LAB. SUB. #1) (PSIA)
PLOT2    341  10                        O2 PRODUCED BY HAB. O2 GEN #1 (PPH)
PLOT2    341  14                        H2 GEN FROM LAB. O2 GEN #1 (PPH)
PLOT2    402  33                        H2 VENTED FROM LAB. O2 GEN #1 (PPH)
PLOT2    407  33                        H2 TO CO2 RED. FROM LAB O2 GEN #1 (PPH)
ENDC
```

C.4.1.2 Input Data SSDATA Description (Continued)

CO_2 Removal

- EDC
- Molecular Sieve
- SAWD

The fifth section contains table data whereby parameters or conditions that vary with time may be input. For example, the number of people in crew #1 for the habitat can be varied with time to permit simulation of the crew moving about the station.

C.4.1.3 Input Data Modification

The user has various options to select. These options define the bussing of hydrogen, nitrogen, carbon dioxide, and process air. For carbon dioxide a further choice is provided between intramodular and intermodular bussing. To date, none of the bussing options have been checked; however, the architecture and logic is in place for these options.

The process air bus option provides a path around the station for process air to flow to the various ECLS equipment. Without a bus, air is simply drawn from the room.

C.4.1.3 Input Data Modification (Continued)

An intramodule hydrogen bus causes any hydrogen generated from either of two units in the module to be dumped to a common line. The same exists for carbon dioxide but with the addition of a COL accumulation in each module and no accumulation with each CO_2 removal unit. For an intermodule CO_2 bus, the CO_2 from all CO_2 removal units dump to a common line with only one CO_2 accumulator for the station.

At present, the nitrogen bus logic is not in place either in the flow connections or in the subroutines themselves where N_2 purging needs to be modeled.

The user also can select which type of unit to perform an ECLSS function. The input setup shown in Table C-7 has Bosch for CO_2 reduction, molecular sieve for CO_2 removal, and solid polymer electrolysis for oxygen generation. To swap one unit for another to perform a function, simply make the component number the one for that function according to the following table:

Function	Location	Unit Number	Component Number
CO_2 Reduction	Habitat	1	121
CO_2 Reduction	Habitat	2	123
CO_2 Reduction	Laboratory	1	321
CO_2 Reduction	Laboratory	2	323
CO_2 Removal	Habitat	1	131
CO_2 Removal	Habitat	2	133
CO_2 Removal	Laboratory	1	331
CO_2 Removal	Laboratory	2	333
O_2 Generation	Habitat	1	141
O_2 Generation	Habitat	2	142
O_2 Generation	Laboratory	1	341
O_2 Generation	Laboratory	2	343

Units that are not used in the simulation should be numbered 500 or above according to Table C-8.

TABLE C-8
COMPONENT NUMBERS FOR UNUSED UNITS

Component Number	Equipment	Location	Unit Number
540	Sabatier	Habitat	1
541	Bosch	"	1
542	Sabatier	"	2
543	Bosch	"	2
550	EDC	"	1
551	SAWD	"	1
552	Molecular Sieve	"	1
553	EDC	"	2
554	SAWD	"	2
555	Molecular Sieve	"	2
560	SPE	"	1
561	KOH	"	1
562	SPE	"	2
563	KOH	"	2
570	Sabatier	Laboratory	1
571	Bosch	"	1
572	Sabatier	"	2
573	Bosch	"	2
580	EDC	"	1
581	SAWD	"	1
582	Molecular Sieve	"	1
583	EDC	"	2
584	SAWD	"	2
585	Molecular Sieve	"	2
590	SPE	"	1
591	KOH	"	1
592	SPE	"	2
593	KOH	"	2

C.4.1.4 Program Output

Five output files are generated; three are tabular data and two are for plots. Table C-9 shows the output data for the input file shown in Table C-7. As discussed earlier, plots are generated using the CAETMS software [3]. Plots generated are presented in Figures C-1 through C-20.

C.4.2 Operation Using the Langley Prime Computer

For instructions on installing and using a program from Hamilton Standard's IBM to Langley's PRIME, please refer to instructions provided in the ECLSB User's Manual [1], Section 4.2.

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SPACE STATION OUTPUT PARAMETERS TABLE 1

TIME	HABITAT PARAMETERS					LABORATORY PARAMETERS					CO2 REMOVAL		ACCUM INLET CO2 FLOW		ACCUM EXIT CO2 FLOW		ACCUM PRESS		O2 GENERATED		WATER FLOW	
	HAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	LAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	O2 GEN	CO2 RED
MIN	F	F	MMHG	PSIA	PSIA	F	F	MMHG	PSIA	PSIA	PPH	PPH	PPH	PPH	PPH	PPH	PSIA	PSIA	PPH	PPH	PPH	PPH
1.0	70.6	50.0	2.800	3.090	14.70	70.6	50.0	2.500	3.090	14.70	.407	.370	0.000	0.000	0.000	0.000	30.0	30.0	.311	.311	0.66	0.00
6.0	70.5	49.0	2.793	3.094	14.71	70.0	48.8	2.493	3.091	14.70	.381	.337	0.000	0.000	0.000	0.000	30.0	29.9	.311	.311	0.72	0.00
11.0	69.4	48.1	2.779	3.087	14.67	69.4	47.8	2.484	3.088	14.67	.378	.331	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.72	0.00
16.0	69.7	47.4	2.771	3.088	14.67	70.1	47.1	2.481	3.092	14.68	.370	.327	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
21.0	70.6	46.8	2.768	3.094	14.69	70.4	46.4	2.477	3.095	14.69	.373	.332	0.000	0.000	0.000	0.000	30.0	29.9	.350	.350	0.80	0.00
26.0	70.0	46.2	2.759	3.093	14.68	69.7	45.7	2.469	3.092	14.67	.375	.332	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
31.0	69.5	45.7	2.748	3.090	14.66	69.7	45.1	2.462	3.093	14.66	.371	.326	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
36.0	70.1	45.3	2.743	3.095	14.67	70.3	44.7	2.459	3.098	14.68	.367	.326	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
41.0	70.3	44.9	2.738	3.098	14.68	70.1	44.2	2.453	3.099	14.67	.371	.329	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
46.0	69.8	44.5	2.729	3.095	14.67	69.7	43.7	2.444	3.098	14.66	.370	.326	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
51.0	69.8	44.2	2.721	3.097	14.66	70.0	43.3	2.440	3.102	14.67	.365	.323	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
56.0	70.3	43.9	2.717	3.101	14.67	70.2	43.0	2.435	3.104	14.67	.366	.325	0.000	0.000	0.000	0.000	29.9	29.9	.350	.350	0.80	0.00
61.0	70.0	43.6	2.709	3.101	14.67	69.9	42.6	2.428	3.104	14.66	.367	.325	0.000	0.000	0.359	0.318	29.6	29.6	.350	.350	0.80	0.48
66.0	69.8	44.6	2.701	3.101	14.67	69.9	43.5	2.421	3.105	14.67	.355	.310	0.000	0.000	0.359	0.318	28.8	28.9	.350	.350	0.80	0.48
71.0	70.6	43.9	2.700	3.108	14.70	70.7	42.7	2.422	3.114	14.70	.369	.328	0.442	0.442	0.359	0.318	28.8	29.0	.350	.350	0.80	0.48
76.0	69.1	43.5	2.685	3.100	14.65	69.0	42.3	2.407	3.105	14.65	.352	.323	0.442	0.442	0.359	0.318	28.9	29.2	.350	.350	0.80	0.48
81.0	70.8	43.4	2.686	3.110	14.69	69.8	42.0	2.403	3.112	14.66	.352	.308	0.442	0.441	0.359	0.318	29.2	29.5	.350	.350	0.80	0.48
86.0	69.6	43.1	2.677	3.109	14.67	70.9	41.8	2.404	3.122	14.70	.357	.321	0.441	0.440	0.359	0.318	29.3	29.9	.350	.350	0.80	0.48
91.0	69.7	42.9	2.669	3.108	14.66	69.7	41.5	2.394	3.117	14.67	.364	.323	0.441	0.440	0.359	0.318	29.5	30.1	.350	.350	0.80	0.48
96.0	69.4	42.7	2.661	3.110	14.66	69.4	41.2	2.385	3.116	14.65	.356	.312	0.441	0.440	0.359	0.318	29.7	30.4	.350	.350	0.80	0.48
101.0	70.5	42.5	2.660	3.117	14.68	70.5	41.0	2.384	3.125	14.68	.355	.313	0.440	0.439	0.359	0.318	29.9	30.7	.350	.350	0.80	0.48
106.0	70.3	42.4	2.655	3.119	14.69	70.2	40.8	2.379	3.126	14.69	.360	.320	0.440	0.438	0.359	0.318	30.1	30.9	.350	.350	0.80	0.48
111.0	69.5	42.1	2.644	3.115	14.66	69.4	40.5	2.369	3.121	14.66	.357	.315	0.440	0.438	0.359	0.318	30.2	31.2	.350	.350	0.80	0.48
116.0	69.9	42.0	2.639	3.118	14.67	70.0	40.3	2.365	3.126	14.67	.352	.309	0.439	0.000	0.359	0.318	30.4	30.7	.350	.350	0.80	0.48
121.0	70.4	41.9	2.637	3.122	14.69	70.5	40.2	2.362	3.130	14.69	.355	.315	0.000	0.000	0.352	0.312	30.0	30.0	.350	.350	0.80	0.47
126.0	69.9	43.0	2.629	3.120	14.68	69.8	41.3	2.354	3.127	14.68	.347	.307	0.000	0.000	0.352	0.312	29.2	29.2	.350	.350	0.80	0.47
131.0	70.2	42.5	2.626	3.124	14.69	70.2	40.7	2.351	3.131	14.69	.358	.317	0.442	0.441	0.352	0.312	29.2	29.4	.350	.350	0.80	0.47
136.0	69.1	42.2	2.613	3.117	14.66	69.3	40.5	2.341	3.126	14.66	.352	.311	0.441	0.441	0.352	0.312	29.3	29.6	.350	.350	0.80	0.47
141.0	70.1	42.1	2.611	3.124	14.68	70.1	40.3	2.338	3.131	14.67	.345	.304	0.441	0.440	0.352	0.312	29.6	29.9	.350	.350	0.80	0.47
146.0	70.7	42.0	2.610	3.130	14.70	70.5	40.1	2.336	3.136	14.69	.353	.312	0.440	0.440	0.352	0.312	29.8	30.2	.350	.350	0.80	0.47
151.0	69.7	41.8	2.600	3.125	14.68	69.7	39.9	2.327	3.132	14.67	.353	.312	0.440	0.439	0.352	0.312	29.9	30.5	.350	.350	0.80	0.47
156.0	69.6	41.6	2.592	3.125	14.66	69.7	39.7	2.320	3.132	14.67	.346	.304	0.440	0.439	0.352	0.312	30.1	30.8	.350	.350	0.80	0.47
161.0	70.4	41.5	2.591	3.131	14.69	70.4	39.6	2.318	3.138	14.69	.347	.306	0.439	0.438	0.352	0.312	30.4	31.1	.350	.350	0.80	0.47
166.0	70.1	41.4	2.586	3.131	14.69	70.1	39.4	2.312	3.137	14.68	.350	.310	0.439	0.438	0.352	0.312	30.6	31.4	.350	.350	0.80	0.47
171.0	69.6	41.2	2.577	3.128	14.67	69.6	39.2	2.304	3.135	14.67	.347	.305	0.439	0.123	0.352	0.312	30.7	31.5	.350	.350	0.80	0.47
176.0	70.0	41.1	2.573	3.130	14.68	70.1	39.0	2.301	3.138	14.68	.344	.303	0.372	0.000	0.352	0.312	30.9	30.8	.350	.350	0.80	0.47
181.0	70.3	41.0	2.570	3.134	14.69	70.3	38.9	2.297	3.141	14.69	.346	.306	0.000	0.000	0.344	0.304	30.1	30.1	.350	.350	0.80	0.45
186.0	69.9	42.2	2.563	3.131	14.68	69.8	40.1	2.290	3.138	14.68	.338	.297	0.000	0.000	0.344	0.304	29.3	29.4	.350	.350	0.80	0.45
191.0	70.3	41.7	2.561	3.136	14.70	70.3	39.6	2.288	3.143	14.70	.349	.308	0.441	0.441	0.344	0.304	29.4	29.5	.350	.350	0.80	0.45
196.0	69.2	41.5	2.549	3.129	14.66	69.3	39.4	2.278	3.137	14.66	.344	.303	0.441	0.441	0.344	0.304	29.5	29.8	.350	.350	0.80	0.45
201.0	70.0	41.4	2.547	3.134	14.68	70.0	39.2	2.274	3.141	14.67	.337	.295	0.440	0.440	0.344	0.304	29.8	30.1	.350	.350	0.80	0.45
206.0	70.6	41.3	2.546	3.140	14.70	70.6	39.1	2.273	3.147	14.70	.344	.303	0.440	0.439	0.344	0.304	30.1	30.5	.350	.350	0.80	0.45
211.0	69.7	41.1	2.537	3.136	14.68	69.7	38.9	2.265	3.143	14.68	.344	.304	0.440	0.439	0.344	0.304	30.2	30.7	.350	.350	0.80	0.45
216.0	69.6	41.0	2.530	3.134	14.67	69.6	38.7	2.258	3.142	14.67	.338	.296	0.439	0.438	0.344	0.304	30.4	31.0	.350	.350	0.80	0.45
221.0	70.4	40.9	2.529	3.140	14.69	70.4	38.6	2.257	3.147	14.69	.338	.298	0.439	0.438	0.344	0.304	30.7	31.4	.350	.350	0.80	0.45
226.0	70.2	40.8	2.524	3.140	14.69	70.1	38.4	2.252	3.147	14.69	.342	.302	0.439	0.437	0.344	0.304	30.9	31.7	.350	.350	0.80	0.45
231.0	69.6	40.7	2.516	3.137	14.67	69.6	38.2	2.244	3.144	14.67	.339	.298	0.438	0.000	0.344	0.304	31.1	31.6	.350	.350	0.80	0.45
236.0	70.0	40.6	2.512	3.139	14.68	70.1	38.1	2.241	3.147	14.68	.335	.294	0.000	0.000	0.344	0.304	31.1	30.9	.350	.350	0.80	0.45
241.0	70.3	40.5	2.510	3.142	14.69	70.3	38.0	2.238	3.150	14.69	.338	.298	0.000	0.000	0.335	0.295	30.3	30.3	.350	.350	0.80	0.44

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SPACE STATION OUTPUT PARAMETERS TABLE 1

	HABITAT PARAMETERS					LABORATORY PARAMETERS					CO2 REMOVAL		ACCUM INLET CO2 FLOW		ACCUM EXIT CO2 FLOW		ACCUM PRESS		O2 GENERATED		WATER FLOW	
TIME	HAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	LAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	O2 GEN	CO2 RED
MIN	F	F	MMHG	PSIA	PSIA	F	F	MMHG	PSIA	PSIA	PPH	PPH	PPH	PPH	PPH	PPH	PSIA	PSIA	PPH	PPH	PPH	PPH
246.0	69.9	41.8	2.503	3.140	14.69	69.8	39.3	2.231	3.147	14.68	.331	.290	0.000	0.000	0.335	0.295	29.5	29.6	.350	.350	0.80	0.44
251.0	70.2	41.3	2.501	3.144	14.70	70.3	38.8	2.229	3.152	14.70	.340	.300	0.441	0.441	0.335	0.295	29.6	29.7	.350	.350	0.80	0.44
256.0	69.2	41.1	2.491	3.137	14.67	69.3	38.6	2.220	3.145	14.67	.335	.295	0.441	0.440	0.335	0.295	29.8	30.0	.350	.350	0.80	0.44
261.0	70.1	41.0	2.489	3.142	14.68	70.1	38.5	2.217	3.150	14.68	.330	.288	0.440	0.440	0.335	0.295	30.0	30.4	.350	.350	0.80	0.44
266.0	70.6	40.9	2.488	3.147	14.70	70.5	38.4	2.216	3.155	14.70	.336	.296	0.440	0.439	0.335	0.295	30.3	30.7	.350	.350	0.80	0.44
271.0	69.7	40.8	2.479	3.143	14.68	69.7	38.2	2.208	3.151	14.68	.336	.296	0.439	0.438	0.335	0.295	30.5	31.0	.350	.350	0.80	0.44
276.0	69.7	40.6	2.473	3.142	14.67	69.7	38.0	2.202	3.150	14.67	.330	.289	0.439	0.438	0.335	0.295	30.7	31.3	.350	.350	0.80	0.44
281.0	70.4	40.6	2.473	3.147	14.69	70.4	37.9	2.201	3.155	14.69	.331	.291	0.438	0.437	0.335	0.295	31.0	31.7	.350	.350	0.80	0.44
286.0	70.5	40.5	2.469	3.149	14.70	70.1	37.8	2.196	3.155	14.69	.335	.294	0.438	0.437	0.335	0.295	31.2	32.0	.350	.350	0.80	0.44
291.0	69.3	40.3	2.460	3.143	14.67	69.6	37.6	2.189	3.152	14.67	.334	.290	0.438	0.000	0.335	0.295	31.4	31.7	.350	.350	0.80	0.44
296.0	69.7	40.2	2.455	3.144	14.67	70.1	37.5	2.186	3.154	14.68	.325	.287	0.000	0.000	0.335	0.295	31.2	31.1	.350	.350	0.80	0.44
301.0	70.7	40.2	2.456	3.152	14.70	70.3	37.4	2.183	3.157	14.69	.329	.291	0.000	0.000	0.328	0.288	30.5	30.4	.350	.350	0.80	0.43
306.0	70.1	41.5	2.450	3.150	14.70	69.8	38.8	2.176	3.154	14.68	.326	.283	0.000	0.000	0.328	0.288	29.7	29.7	.350	.350	0.80	0.43
311.0	69.8	41.1	2.446	3.150	14.70	70.3	38.3	2.175	3.159	14.70	.333	.293	0.441	0.440	0.328	0.288	29.7	29.9	.350	.350	0.80	0.43
316.0	69.2	40.9	2.436	3.145	14.67	69.3	38.1	2.166	3.153	14.67	.326	.288	0.440	0.440	0.328	0.288	30.0	30.2	.350	.350	0.80	0.43
321.0	70.4	40.8	2.437	3.152	14.70	70.1	38.0	2.164	3.157	14.68	.323	.282	0.440	0.439	0.328	0.288	30.3	30.6	.350	.350	0.80	0.43
326.0	70.5	40.7	2.435	3.155	14.71	70.5	37.9	2.163	3.161	14.70	.330	.289	0.439	0.439	0.328	0.288	30.5	30.9	.350	.350	0.80	0.43
331.0	70.1	40.6	2.429	3.153	14.70	69.7	37.7	2.155	3.157	14.68	.331	.289	0.439	0.438	0.328	0.288	30.8	31.2	.350	.350	0.80	0.43
336.0	69.6	40.4	2.422	3.150	14.68	69.7	37.6	2.150	3.156	14.67	.329	.282	0.438	0.437	0.328	0.288	31.0	31.6	.350	.350	0.80	0.43
341.0	69.5	40.3	2.416	3.149	14.67	70.4	37.5	2.149	3.161	14.69	.321	.284	0.438	0.437	0.328	0.288	31.2	32.0	.350	.350	0.80	0.43
346.0	70.5	40.3	2.417	3.156	14.70	70.1	37.3	2.144	3.161	14.69	.323	.287	0.437	0.436	0.328	0.288	31.6	32.3	.350	.350	0.80	0.43
351.0	70.2	40.2	2.413	3.156	14.70	69.7	37.2	2.138	3.158	14.67	.327	.284	0.437	0.000	0.328	0.288	31.8	31.8	.350	.350	0.80	0.43
356.0	69.5	40.0	2.405	3.151	14.68	70.1	37.1	2.135	3.161	14.68	.324	.281	0.000	0.000	0.328	0.288	31.3	31.2	.350	.350	0.80	0.43
361.0	70.1	39.9	2.403	3.154	14.69	70.2	36.9	2.132	3.163	14.69	.320	.284	0.000	0.000	0.321	0.281	30.6	30.5	.350	.350	0.80	0.42
366.0	70.4	41.2	2.401	3.157	14.70	69.8	38.4	2.127	3.160	14.68	.316	.276	0.000	0.000	0.321	0.281	29.9	29.9	.350	.350	0.80	0.42
371.0	70.3	40.8	2.399	3.160	14.71	70.3	37.9	2.126	3.165	14.70	.328	.286	0.440	0.440	0.321	0.281	30.0	30.1	.350	.350	0.80	0.42
376.0	69.5	40.6	2.390	3.154	14.68	69.3	37.7	2.117	3.159	14.67	.326	.282	0.440	0.440	0.321	0.281	30.2	30.4	.350	.350	0.80	0.42
381.0	69.4	40.5	2.385	3.153	14.68	70.0	37.6	2.115	3.162	14.68	.321	.275	0.439	0.439	0.321	0.281	30.4	30.8	.350	.350	0.80	0.42
386.0	70.1	40.4	2.383	3.156	14.69	70.6	37.5	2.114	3.168	14.70	.317	.282	0.439	0.438	0.321	0.281	30.8	31.2	.350	.350	0.80	0.42
391.0	70.4	40.3	2.382	3.160	14.70	69.7	37.3	2.108	3.164	14.68	.321	.282	0.438	0.438	0.321	0.281	31.0	31.5	.350	.350	0.80	0.42
396.0	69.7	40.2	2.375	3.157	14.69	69.7	37.2	2.102	3.162	14.67	.321	.276	0.438	0.437	0.321	0.281	31.3	31.8	.350	.350	0.80	0.42
401.0	69.8	40.1	2.371	3.156	14.68	70.4	37.1	2.101	3.167	14.69	.317	.277	0.437	0.436	0.321	0.281	31.5	32.2	.350	.350	0.80	0.42
406.0	70.3	40.0	2.370	3.160	14.70	70.1	37.0	2.098	3.167	14.69	.318	.281	0.437	0.436	0.321	0.281	31.8	32.5	.350	.350	0.80	0.42
411.0	70.0	39.9	2.366	3.160	14.69	69.7	36.8	2.092	3.164	14.68	.320	.278	0.437	0.000	0.321	0.281	32.1	31.9	.350	.350	0.80	0.42
416.0	69.8	39.9	2.364	3.158	14.68	70.1	36.7	2.089	3.166	14.68	.318	.275	0.000	0.000	0.321	0.281	31.5	31.3	.350	.350	0.80	0.42
421.0	70.1	39.9	2.366	3.160	14.69	70.2	36.6	2.087	3.169	14.69	.317	.278	0.000	0.000	0.315	0.275	30.8	30.7	.350	.350	0.80	0.41
426.0	70.2	41.4	2.369	3.161	14.70	69.8	38.1	2.082	3.166	14.68	.312	.270	0.000	0.000	0.315	0.275	30.0	30.0	.350	.350	0.80	0.41
431.0	70.3	41.2	2.376	3.165	14.72	70.3	37.7	2.082	3.171	14.70	.324	.280	0.440	0.440	0.315	0.275	30.1	30.2	.350	.350	0.80	0.41
436.0	69.0	41.3	2.375	3.155	14.67	69.3	37.5	2.075	3.164	14.67	.320	.276	0.440	0.439	0.315	0.275	30.3	30.5	.350	.350	0.80	0.41
441.0	70.1	41.6	2.385	3.160	14.69	70.1	37.4	2.074	3.168	14.68	.315	.269	0.439	0.439	0.315	0.275	30.7	31.0	.350	.350	0.80	0.41
446.0	70.8	41.8	2.399	3.166	14.72	70.6	37.4	2.076	3.173	14.70	.324	.277	0.438	0.438	0.315	0.275	31.0	31.4	.350	.350	0.80	0.41
451.0	69.7	42.1	2.404	3.160	14.70	69.7	37.3	2.071	3.169	14.68	.327	.278	0.438	0.437	0.315	0.275	31.2	31.7	.350	.350	0.80	0.41
456.0	69.5	42.3	2.413	3.158	14.69	69.7	37.3	2.069	3.167	14.67	.323	.271	0.438	0.437	0.315	0.275	31.5	32.0	.350	.350	0.80	0.41
461.0	70.5	42.7	2.430	3.163	14.72	70.4	37.3	2.072	3.172	14.70	.325	.273	0.437	0.436	0.315	0.275	31.8	32.5	.350	.350	0.80	0.41
466.0	70.2	43.0	2.444	3.163	14.72	70.1	37.3	2.072	3.172	14.69	.331	.277	0.436	0.117	0.315	0.275	32.1	32.7	.350	.350	0.80	0.41
471.0	69.6	43.3	2.456	3.159	14.70	69.6	37.3	2.070	3.168	14.68	.332	.274	0.355	0.000	0.315	0.275	32.3	32.0	.350	.350	0.80	0.41
476.0	70.0	43.6	2.473	3.161	14.71	70.1	37.3	2.073	3.170	14.69	.331	.272	0.000	0.000	0.315	0.275	31.6	31.4	.350	.350	0.80	0.41
481.0	70.4	44.0	2.493	3.164	14.73	70.3	37.4	2.077	3.173	14.70	.337	.277	0.000	0.000	0.318	0.270	30.9	30.8	.350	.350	0.80	0.41
486.0	69.9	45.5	2.507	3.160	14.72	69.8	38.9	2.077	3.169	14.69	.331	.269	0.000	0.000	0.318	0.270	30.2	30.2	.350	.350	0.80	0.41

ORIGINAL PAGE IS
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SPACE STATION OUTPUT PARAMETERS TABLE 1

	HABITAT PARAMETERS					LABORATORY PARAMETERS					CO2 REMOVAL		ACCUM INLET CO2 FLOW		ACCUM EXIT CO2 FLOW		ACCUM PRESS		O2 GENERATED		WATER FLOW	
TIME	HAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	LAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	O2 GEN	CO2 RED
MIN	F	F	MMHG	PSIA	PSIA	F	F	MMHG	PSIA	PSIA	PPH	PPH	PPH	PPH	PPH	PPH	PSIA	PSIA	PPH	PPH	PPH	PPH
491.0	70.2	45.3	2.527	3.164	14.74	70.3	38.7	2.083	3.174	14.71	.345	.280	0.440	0.439	0.318	0.270	30.3	30.4	.350	.350	0.80	0.41
496.0	69.2	45.4	2.536	3.156	14.70	69.4	38.7	2.083	3.168	14.68	.342	.277	0.439	0.439	0.318	0.270	30.5	30.7	.350	.350	0.80	0.41
501.0	70.1	45.6	2.555	3.160	14.72	70.1	38.7	2.089	3.170	14.69	.340	.272	0.439	0.438	0.318	0.270	30.8	31.1	.350	.350	0.80	0.41
506.0	70.6	45.7	2.573	3.165	14.74	70.5	38.8	2.096	3.175	14.71	.348	.279	0.438	0.437	0.318	0.270	31.1	31.5	.350	.350	0.80	0.41
511.0	69.8	45.8	2.584	3.160	14.72	69.7	38.9	2.098	3.171	14.69	.351	.281	0.438	0.437	0.318	0.270	31.3	31.9	.350	.350	0.80	0.41
516.0	69.6	45.8	2.595	3.158	14.71	69.7	38.9	2.103	3.169	14.68	.348	.276	0.437	0.436	0.318	0.270	31.6	32.2	.350	.350	0.80	0.41
521.0	70.3	45.9	2.612	3.162	14.73	70.4	39.0	2.111	3.173	14.70	.350	.279	0.437	0.436	0.318	0.270	31.9	32.7	.350	.350	0.80	0.41
526.0	70.2	46.0	2.625	3.162	14.73	70.1	39.1	2.117	3.173	14.70	.356	.283	0.436	0.000	0.318	0.270	32.2	32.8	.350	.350	0.80	0.41
531.0	69.7	46.0	2.635	3.159	14.72	69.6	39.1	2.121	3.169	14.69	.356	.281	0.436	0.000	0.318	0.270	32.4	32.1	.350	.350	0.80	0.41
536.0	69.9	46.0	2.647	3.159	14.72	70.1	39.2	2.128	3.171	14.70	.355	.280	0.000	0.000	0.318	0.270	31.8	31.5	.350	.350	0.80	0.41
541.0	70.3	46.1	2.661	3.161	14.73	70.3	39.3	2.136	3.173	14.71	.359	.284	0.000	0.000	0.341	0.273	31.0	30.9	.350	.350	0.80	0.43
546.0	70.1	47.2	2.672	3.160	14.73	69.8	40.7	2.141	3.170	14.70	.352	.277	0.000	0.000	0.341	0.273	30.2	30.3	.350	.350	0.80	0.43
551.0	70.3	46.8	2.687	3.164	14.75	70.3	40.4	2.151	3.175	14.72	.367	.289	0.440	0.439	0.341	0.273	30.3	30.5	.350	.350	0.80	0.43
556.0	69.0	46.6	2.689	3.154	14.70	69.3	40.3	2.153	3.167	14.68	.364	.286	0.439	0.439	0.341	0.273	30.4	30.8	.350	.350	0.80	0.43
561.0	70.0	46.7	2.702	3.158	14.72	70.1	40.4	2.162	3.170	14.70	.358	.280	0.439	0.438	0.341	0.273	30.7	31.2	.350	.350	0.80	0.43
566.0	70.8	46.7	2.719	3.164	14.75	70.6	40.4	2.173	3.175	14.72	.367	.290	0.438	0.437	0.341	0.273	31.0	31.6	.350	.350	0.80	0.43
571.0	69.8	46.6	2.725	3.160	14.73	69.7	40.4	2.177	3.170	14.70	.371	.292	0.438	0.437	0.341	0.273	31.1	31.9	.350	.350	0.80	0.43
576.0	69.5	46.5	2.732	3.156	14.71	69.6	40.4	2.183	3.168	14.69	.367	.286	0.438	0.436	0.341	0.273	31.3	32.3	.350	.350	0.80	0.43
581.0	70.3	46.6	2.746	3.160	14.73	70.4	40.5	2.194	3.173	14.71	.367	.289	0.437	0.435	0.341	0.273	31.6	32.7	.350	.350	0.80	0.43
586.0	70.3	46.6	2.757	3.162	14.74	70.1	40.5	2.201	3.173	14.71	.373	.295	0.437	0.062	0.341	0.273	31.8	32.9	.350	.350	0.80	0.43
591.0	69.7	46.5	2.763	3.158	14.72	69.6	40.4	2.205	3.169	14.69	.374	.292	0.437	0.000	0.341	0.273	32.0	32.3	.350	.350	0.80	0.43
596.0	69.8	46.5	2.772	3.157	14.72	70.1	40.4	2.214	3.171	14.70	.372	.290	0.000	0.000	0.341	0.273	31.9	31.7	.350	.350	0.80	0.43
601.0	70.3	46.5	2.784	3.160	14.74	70.3	40.5	2.224	3.173	14.71	.375	.296	0.000	0.000	0.360	0.283	31.2	31.0	.350	.350	0.80	0.45
606.0	70.1	47.6	2.792	3.159	14.74	69.8	41.8	2.229	3.170	14.70	.368	.289	0.000	0.000	0.360	0.283	30.4	30.4	.350	.350	0.80	0.45
611.0	70.3	47.2	2.805	3.163	14.75	70.3	41.3	2.240	3.174	14.72	.383	.302	0.439	0.439	0.360	0.283	30.3	30.6	.350	.350	0.80	0.45
616.0	68.9	47.0	2.804	3.153	14.70	69.2	41.2	2.242	3.167	14.69	.379	.298	0.439	0.439	0.360	0.283	30.4	30.9	.350	.350	0.80	0.45
621.0	70.0	47.0	2.816	3.156	14.72	70.1	41.2	2.252	3.170	14.70	.373	.292	0.439	0.438	0.360	0.283	30.7	31.3	.350	.350	0.80	0.45
626.0	70.8	47.0	2.831	3.163	14.75	70.6	41.2	2.263	3.175	14.72	.382	.302	0.439	0.437	0.360	0.283	30.9	31.6	.350	.350	0.80	0.45
631.0	69.8	46.9	2.835	3.158	14.73	69.6	41.1	2.267	3.169	14.70	.386	.304	0.438	0.437	0.360	0.283	31.0	31.9	.350	.350	0.80	0.45
636.0	69.4	46.8	2.840	3.154	14.71	69.6	41.1	2.273	3.167	14.69	.381	.297	0.438	0.436	0.360	0.283	31.2	32.3	.350	.350	0.80	0.45
641.0	70.3	46.8	2.853	3.159	14.73	70.5	41.1	2.284	3.172	14.71	.382	.301	0.438	0.436	0.360	0.283	31.4	32.7	.350	.350	0.80	0.45
646.0	70.3	46.8	2.862	3.161	14.74	70.1	41.1	2.291	3.172	14.71	.388	.307	0.437	0.435	0.360	0.283	31.6	33.0	.350	.350	0.80	0.45
651.0	69.7	46.7	2.867	3.156	14.72	69.6	41.0	2.296	3.168	14.69	.388	.304	0.437	0.000	0.360	0.283	31.7	32.4	.350	.350	0.80	0.45
656.0	69.8	46.6	2.874	3.156	14.72	70.1	41.0	2.305	3.170	14.70	.386	.302	0.437	0.000	0.360	0.283	31.9	31.8	.350	.350	0.80	0.45
661.0	70.3	46.7	2.885	3.159	14.74	70.3	41.0	2.314	3.172	14.71	.388	.308	0.000	0.000	0.375	0.295	31.3	31.2	.350	.350	0.80	0.47
666.0	70.1	47.8	2.892	3.158	14.74	69.8	42.2	2.319	3.169	14.70	.382	.301	0.000	0.000	0.375	0.295	30.5	30.5	.350	.350	0.80	0.47
671.0	70.3	47.3	2.904	3.162	14.75	70.3	41.7	2.330	3.173	14.72	.396	.314	0.439	0.439	0.375	0.295	30.4	30.6	.350	.350	0.80	0.47
676.0	68.9	47.1	2.902	3.152	14.70	69.2	41.6	2.331	3.166	14.69	.393	.310	0.439	0.439	0.375	0.295	30.5	30.9	.350	.350	0.80	0.47
681.0	70.0	47.1	2.913	3.155	14.72	70.1	41.6	2.341	3.169	14.70	.386	.303	0.439	0.438	0.375	0.295	30.7	31.3	.350	.350	0.80	0.47
686.0	70.8	47.2	2.927	3.162	14.75	70.6	41.5	2.352	3.174	14.73	.395	.314	0.439	0.437	0.375	0.295	30.9	31.6	.350	.350	0.80	0.47
691.0	69.8	47.0	2.930	3.157	14.73	69.7	41.4	2.356	3.169	14.70	.399	.316	0.438	0.437	0.375	0.295	31.0	31.9	.350	.350	0.80	0.47
696.0	69.4	46.9	2.934	3.153	14.71	69.6	41.4	2.361	3.166	14.69	.394	.309	0.438	0.436	0.375	0.295	31.1	32.2	.350	.350	0.80	0.47
701.0	70.3	46.9	2.946	3.158	14.73	70.5	41.3	2.372	3.171	14.71	.394	.313	0.438	0.436	0.375	0.295	31.3	32.6	.350	.350	0.80	0.47
706.0	70.4	46.9	2.955	3.160	14.74	70.1	41.3	2.379	3.171	14.71	.400	.319	0.438	0.435	0.375	0.295	31.4	32.9	.350	.350	0.80	0.47
711.0	69.7	46.7	2.955	3.155	14.72	69.6	41.2	2.383	3.167	14.69	.400	.316	0.437	0.000	0.375	0.295	31.5	32.6	.350	.350	0.80	0.47
716.0	69.8	46.3	2.953	3.155	14.72	70.1	41.2	2.391	3.169	14.70	.396	.314	0.437	0.000	0.375	0.295	31.7	32.0	.350	.350	0.80	0.47
721.0	70.3	46.0	2.951	3.159	14.73	70.3	41.1	2.399	3.171	14.71	.397	.319	0.000	0.000	0.387	0.306	31.5	31.3	.350	.350	0.80	0.49
726.0	70.1	46.7	2.943	3.158	14.73	69.8	42.3	2.403	3.168	14.70	.388	.312	0.000	0.000	0.387	0.306	30.6	30.6	.350	.350	0.80	0.49
731.0	70.3	45.9	2.940	3.162	14.74	70.3	41.8	2.411	3.173	14.72	.402	.325	0.439	0.439	0.387	0.306	30.5	30.7	.350	.350	0.80	0.49

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SPACE STATION OUTPUT PARAMETERS TABLE 1

	HABITAT PARAMETERS					LABORATORY PARAMETERS					CO2 REMOVAL		ACCUM INLET CO2 FLOW		ACCUM EXIT CO2 FLOW		ACCUM PRESS		O2 GENERATED		WATER FLOW	
TIME	HAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	LAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	O2 GEN	CO2 RED
MIN	F	F	MMHG	PSIA	PSIA	F	F	MMHG	PSIA	PSIA	PPH	PPH	PPH	PPH	PPH	PPH	PSIA	PSIA	PPH	PPH	PPH	PPH
736.0	68.9	45.4	2.924	3.152	14.69	69.2	41.5	2.410	3.165	14.69	.395	.320	0.439	0.438	0.387	0.306	30.5	30.9	.350	.350	0.80	0.49
741.0	70.0	45.2	2.923	3.156	14.71	70.1	41.4	2.417	3.168	14.70	.386	.313	0.439	0.438	0.387	0.306	30.7	31.3	.350	.350	0.80	0.49
746.0	70.8	45.0	2.924	3.164	14.74	70.6	41.3	2.425	3.173	14.72	.395	.323	0.439	0.437	0.387	0.306	30.9	31.6	.350	.350	0.80	0.49
751.0	69.7	44.7	2.914	3.158	14.71	69.6	41.1	2.424	3.168	14.70	.397	.325	0.438	0.437	0.387	0.306	30.9	31.9	.350	.350	0.80	0.49
756.0	69.5	44.4	2.906	3.155	14.70	69.6	41.0	2.425	3.166	14.69	.389	.317	0.438	0.436	0.387	0.306	31.0	32.2	.350	.350	0.80	0.49
761.0	70.4	44.3	2.908	3.161	14.72	70.5	40.9	2.432	3.172	14.71	.389	.321	0.438	0.436	0.387	0.306	31.2	32.5	.350	.350	0.80	0.49
766.0	70.3	44.1	2.905	3.162	14.72	70.1	40.7	2.434	3.171	14.71	.394	.326	0.438	0.435	0.387	0.306	31.3	32.8	.350	.350	0.80	0.49
771.0	69.6	43.9	2.897	3.157	14.70	69.6	40.6	2.433	3.167	14.69	.392	.322	0.438	0.000	0.387	0.306	31.4	32.8	.350	.350	0.80	0.49
776.0	69.9	43.8	2.895	3.158	14.71	70.1	40.5	2.437	3.170	14.70	.382	.319	0.437	0.000	0.387	0.306	31.5	32.1	.350	.350	0.80	0.49
781.0	70.4	43.7	2.896	3.163	14.72	70.3	40.3	2.440	3.172	14.71	.392	.325	0.000	0.000	0.386	0.315	31.3	31.4	.350	.350	0.80	0.49
786.0	69.8	44.8	2.890	3.159	14.71	69.8	41.5	2.439	3.169	14.70	.382	.316	0.000	0.000	0.386	0.315	30.4	30.7	.350	.350	0.80	0.49
791.0	70.3	44.4	2.893	3.164	14.73	70.3	41.0	2.444	3.174	14.72	.394	.329	0.440	0.439	0.386	0.315	30.3	30.8	.350	.350	0.80	0.49
796.0	69.2	44.2	2.884	3.156	14.69	69.3	40.8	2.439	3.166	14.68	.390	.324	0.439	0.438	0.386	0.315	30.4	31.0	.350	.350	0.80	0.49
801.0	70.5	44.2	2.891	3.163	14.72	70.1	40.7	2.443	3.169	14.70	.388	.317	0.439	0.438	0.386	0.315	30.6	31.3	.350	.350	0.80	0.49
806.0	70.2	44.1	2.891	3.163	14.72	70.6	40.6	2.448	3.175	14.72	.392	.326	0.439	0.437	0.386	0.315	30.7	31.7	.350	.350	0.80	0.49
811.0	69.6	44.1	2.888	3.158	14.70	69.6	40.5	2.445	3.170	14.70	.390	.327	0.439	0.437	0.386	0.315	30.7	31.9	.350	.350	0.80	0.49
816.0	70.0	44.1	2.892	3.160	14.71	69.7	40.3	2.445	3.168	14.69	.387	.320	0.439	0.436	0.386	0.315	30.9	32.1	.350	.350	0.80	0.49
821.0	70.3	44.1	2.897	3.163	14.72	70.5	40.3	2.450	3.173	14.71	.391	.323	0.438	0.436	0.386	0.315	31.0	32.5	.350	.350	0.80	0.49
826.0	69.9	44.2	2.898	3.161	14.71	70.1	40.2	2.450	3.172	14.70	.392	.328	0.438	0.435	0.386	0.315	31.1	32.7	.350	.350	0.80	0.49
831.0	69.8	44.2	2.900	3.160	14.71	69.6	40.1	2.448	3.169	14.69	.390	.324	0.438	0.435	0.386	0.315	31.2	33.0	.350	.350	0.80	0.49
836.0	70.1	44.3	2.906	3.162	14.72	70.1	40.0	2.452	3.171	14.70	.391	.322	0.438	0.000	0.386	0.315	31.4	32.3	.350	.350	0.80	0.49
841.0	70.1	44.4	2.911	3.162	14.72	70.3	39.9	2.455	3.173	14.71	.393	.327	0.000	0.000	0.383	0.318	31.1	31.6	.350	.350	0.80	0.49
846.0	70.0	45.6	2.915	3.160	14.72	69.8	41.2	2.454	3.170	14.70	.384	.318	0.000	0.000	0.383	0.318	30.2	30.8	.350	.350	0.80	0.49
851.0	70.4	45.2	2.926	3.166	14.74	70.4	40.8	2.459	3.175	14.72	.399	.331	0.440	0.438	0.383	0.318	30.2	30.9	.350	.350	0.80	0.49
856.0	69.1	45.2	2.923	3.156	14.70	69.3	40.6	2.455	3.168	14.68	.396	.327	0.440	0.438	0.383	0.318	30.2	31.1	.350	.350	0.80	0.49
861.0	69.9	45.2	2.932	3.159	14.71	70.0	40.6	2.459	3.171	14.69	.389	.319	0.439	0.438	0.383	0.318	30.4	31.5	.350	.350	0.80	0.49
866.0	70.7	45.4	2.945	3.166	14.74	70.6	40.6	2.466	3.176	14.72	.397	.329	0.439	0.437	0.383	0.318	30.6	31.8	.350	.350	0.80	0.49
871.0	69.8	45.4	2.948	3.161	14.72	69.9	40.5	2.465	3.172	14.70	.401	.331	0.439	0.437	0.383	0.318	30.6	32.0	.350	.350	0.80	0.49
876.0	69.5	45.4	2.952	3.158	14.70	69.5	40.4	2.465	3.169	14.68	.397	.326	0.439	0.436	0.383	0.318	30.8	32.2	.350	.350	0.80	0.49
881.0	70.3	45.5	2.964	3.162	14.72	70.2	40.4	2.470	3.172	14.70	.397	.323	0.438	0.436	0.383	0.318	30.9	32.5	.350	.350	0.80	0.49
886.0	70.3	45.7	2.974	3.163	14.73	70.4	40.4	2.475	3.175	14.71	.403	.330	0.438	0.435	0.383	0.318	31.0	32.8	.350	.350	0.80	0.49
891.0	69.7	45.7	2.979	3.160	14.71	69.7	40.3	2.475	3.171	14.69	.403	.330	0.438	0.435	0.383	0.318	31.1	33.0	.350	.350	0.80	0.49
896.0	69.9	45.8	2.988	3.159	14.71	69.9	40.3	2.478	3.171	14.69	.401	.325	0.438	0.000	0.383	0.318	31.3	32.4	.350	.350	0.80	0.49
901.0	70.3	45.9	3.000	3.162	14.73	70.4	40.3	2.485	3.174	14.71	.404	.329	0.000	0.000	0.390	0.321	31.0	31.7	.350	.350	0.80	0.50
906.0	70.1	47.1	3.009	3.161	14.73	70.0	41.6	2.487	3.172	14.71	.397	.324	0.000	0.000	0.390	0.321	30.1	31.0	.350	.350	0.80	0.50
911.0	70.3	46.8	3.021	3.165	14.75	70.2	41.2	2.494	3.175	14.72	.413	.336	0.440	0.438	0.390	0.321	30.0	31.1	.350	.350	0.80	0.50
916.0	68.9	46.6	3.020	3.155	14.70	69.2	41.1	2.491	3.167	14.68	.409	.330	0.440	0.438	0.390	0.321	30.1	31.3	.350	.350	0.80	0.50
921.0	70.0	46.7	3.033	3.159	14.72	70.2	41.1	2.499	3.172	14.70	.401	.323	0.440	0.437	0.390	0.321	30.3	31.6	.350	.350	0.80	0.50
926.0	70.8	46.8	3.048	3.165	14.75	70.6	41.1	2.508	3.177	14.72	.412	.335	0.439	0.437	0.390	0.321	30.4	31.9	.350	.350	0.80	0.50
931.0	69.8	46.7	3.051	3.160	14.73	69.5	41.0	2.508	3.171	14.69	.415	.336	0.439	0.436	0.390	0.321	30.5	32.1	.350	.350	0.80	0.50
936.0	69.4	46.6	3.055	3.156	14.71	69.7	40.9	2.511	3.169	14.69	.410	.328	0.439	0.436	0.390	0.321	30.6	32.3	.350	.350	0.80	0.50
941.0	70.3	46.7	3.067	3.161	14.73	70.5	41.0	2.521	3.175	14.71	.411	.333	0.439	0.436	0.390	0.321	30.7	32.7	.350	.350	0.80	0.50
946.0	70.3	46.7	3.076	3.163	14.74	70.0	40.9	2.524	3.173	14.71	.417	.338	0.439	0.435	0.390	0.321	30.8	32.9	.350	.350	0.80	0.50
951.0	69.6	46.6	3.079	3.158	14.72	69.6	40.9	2.526	3.169	14.69	.417	.334	0.439	0.435	0.390	0.321	30.9	33.1	.350	.350	0.80	0.50
956.0	69.8	46.6	3.087	3.158	14.72	70.2	40.9	2.533	3.172	14.70	.414	.332	0.438	0.000	0.390	0.321	31.0	32.6	.350	.350	0.80	0.50
961.0	70.3	46.6	3.097	3.162	14.73	70.3	40.9	2.540	3.174	14.71	.417	.339	0.000	0.000	0.403	0.326	30.7	31.9	.350	.350	0.80	0.51
966.0	70.1	47.7	3.103	3.160	14.73	69.8	42.1	2.542	3.170	14.70	.409	.330	0.000	0.000	0.403	0.326	29.8	31.1	.350	.350	0.80	0.51
971.0	70.3	47.3	3.113	3.164	14.75	70.3	41.6	2.552	3.175	14.72	.425	.344	0.441	0.438	0.403	0.326	29.7	31.2	.350	.350	0.80	0.51
976.0	68.9	47.1	3.110	3.154	14.70	69.3	41.5	2.550	3.168	14.69	.421	.339	0.441	0.438	0.403	0.326	29.7	31.4	.350	.350	0.80	0.51

ORIGINAL PAGE IS
OF POOR QUALITY

SPACE STATION OUTPUT PARAMETERS TABLE 1

	HABITAT PARAMETERS					LABORATORY PARAMETERS					CO2 REMOVAL		ACCUM INLET CO2 FLOW		ACCUM EXIT CO2 FLOW		ACCUM PRESS		O2 GENERATED		WATER FLOW	
TIME	HAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	LAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	O2 GEN	CO2 RED
MIN	F	F	MMHG	PSIA	PSIA	F	F	MMHG	PSIA	PSIA	PPH	PPH	PPH	PPH	PPH	PPH	PSIA	PSIA	PPH	PPH	PPH	PPH
981.0	70.0	47.0	3.120	3.157	14.72	70.0	41.5	2.558	3.170	14.70	.413	.332	0.440	0.437	0.403	0.326	29.9	31.7	.350	.350	0.80	0.51
986.0	70.8	47.1	3.134	3.164	14.75	70.6	41.5	2.568	3.176	14.72	.423	.342	0.440	0.437	0.403	0.326	30.0	32.0	.350	.350	0.80	0.51
991.0	69.8	47.0	3.135	3.159	14.73	69.7	41.4	2.569	3.171	14.70	.427	.344	0.440	0.436	0.403	0.326	30.0	32.1	.350	.350	0.80	0.51
996.0	69.4	46.8	3.137	3.155	14.71	69.6	41.3	2.572	3.169	14.69	.422	.337	0.440	0.436	0.403	0.326	30.1	32.4	.350	.350	0.80	0.51
1001.0	70.3	46.9	3.148	3.160	14.73	70.4	41.3	2.582	3.173	14.71	.421	.340	0.440	0.435	0.403	0.326	30.2	32.7	.350	.350	0.80	0.51
1006.0	70.3	46.8	3.156	3.162	14.74	70.1	41.2	2.587	3.173	14.71	.428	.346	0.439	0.435	0.403	0.326	30.3	32.9	.350	.350	0.80	0.51
1011.0	69.7	46.7	3.158	3.158	14.72	69.6	41.2	2.588	3.169	14.69	.428	.343	0.439	0.435	0.403	0.326	30.3	33.1	.350	.350	0.80	0.51
1016.0	69.8	46.7	3.163	3.157	14.72	70.1	41.1	2.595	3.171	14.70	.424	.340	0.000	0.000	0.403	0.326	30.4	32.7	.350	.350	0.80	0.51
1021.0	70.3	46.7	3.173	3.161	14.73	70.3	41.1	2.603	3.173	14.71	.427	.346	0.000	0.000	0.415	0.334	30.1	32.0	.350	.350	0.80	0.53
1026.0	70.1	47.8	3.177	3.159	14.73	69.8	42.3	2.605	3.170	14.70	.419	.338	0.442	0.000	0.415	0.334	29.2	31.2	.350	.350	0.80	0.53
1031.0	70.3	47.3	3.185	3.163	14.75	70.3	41.8	2.614	3.175	14.72	.435	.352	0.442	0.438	0.415	0.334	29.0	31.3	.350	.350	0.80	0.53
1036.0	68.9	47.0	3.176	3.153	14.70	69.2	41.7	2.613	3.167	14.68	.430	.347	0.442	0.438	0.415	0.334	29.0	31.5	.388	.388	0.89	0.53
1041.0	70.0	46.8	3.182	3.157	14.72	70.1	41.6	2.620	3.170	14.70	.421	.339	0.441	0.437	0.415	0.334	29.2	31.7	.388	.388	0.89	0.53
1046.0	70.8	46.7	3.189	3.164	14.75	70.6	41.6	2.629	3.175	14.72	.431	.351	0.441	0.437	0.415	0.334	29.3	32.0	.350	.350	0.80	0.53
1051.0	69.8	46.4	3.183	3.159	14.72	69.6	41.5	2.629	3.170	14.70	.433	.353	0.441	0.436	0.415	0.334	29.3	32.2	.350	.350	0.80	0.53
1056.0	69.4	46.1	3.177	3.155	14.70	69.6	41.3	2.632	3.168	14.69	.427	.344	0.441	0.436	0.415	0.334	29.3	32.4	.388	.388	0.89	0.53
1061.0	70.3	45.9	3.179	3.160	14.72	70.5	41.3	2.640	3.173	14.71	.425	.348	0.441	0.435	0.415	0.334	29.4	32.7	.350	.350	0.80	0.53
1066.0	70.3	45.7	3.177	3.162	14.73	70.1	41.2	2.643	3.173	14.71	.431	.354	0.441	0.435	0.415	0.334	29.5	32.9	.350	.350	0.80	0.53
1071.0	69.6	45.4	3.167	3.158	14.71	69.6	41.1	2.643	3.169	14.69	.429	.350	0.441	0.435	0.415	0.334	29.5	33.1	.388	.388	0.89	0.53
1076.0	69.8	45.1	3.161	3.158	14.71	70.1	41.0	2.647	3.171	14.70	.424	.347	0.000	0.000	0.421	0.342	29.6	32.9	.388	.388	0.89	0.54
1081.0	70.3	44.8	3.158	3.162	14.72	70.3	40.9	2.652	3.173	14.71	.425	.353	0.000	0.000	0.421	0.342	29.2	32.2	.350	.350	0.80	0.54
1086.0	70.1	45.7	3.150	3.161	14.72	69.8	42.0	2.651	3.170	14.70	.416	.344	0.443	0.000	0.421	0.342	28.3	31.4	.388	.388	0.89	0.54
1091.0	70.3	45.1	3.148	3.165	14.73	70.3	41.5	2.657	3.175	14.72	.430	.358	0.443	0.438	0.421	0.342	28.1	31.4	.350	.350	0.80	0.54
1096.0	68.9	44.8	3.131	3.155	14.69	69.2	41.3	2.652	3.167	14.68	.423	.352	0.443	0.437	0.421	0.342	28.1	31.6	.388	.388	0.89	0.54
1101.0	70.1	44.6	3.130	3.160	14.70	70.1	41.2	2.655	3.170	14.69	.414	.344	0.443	0.437	0.421	0.342	28.2	31.8	.388	.388	0.89	0.54
1106.0	70.8	44.5	3.132	3.166	14.73	70.6	41.0	2.661	3.176	14.72	.424	.355	0.443	0.436	0.421	0.342	28.3	32.1	.350	.350	0.80	0.54
1111.0	69.7	44.3	3.121	3.161	14.71	69.6	40.9	2.657	3.171	14.69	.425	.356	0.443	0.436	0.421	0.342	28.3	32.2	.388	.388	0.89	0.54
1116.0	69.5	44.0	3.113	3.158	14.69	69.6	40.7	2.655	3.169	14.68	.417	.347	0.443	0.436	0.421	0.342	28.4	32.4	.388	.388	0.89	0.54
1121.0	70.4	44.0	3.114	3.164	14.72	70.5	40.6	2.660	3.174	14.71	.417	.351	0.443	0.435	0.421	0.342	28.5	32.7	.388	.388	0.89	0.54
1126.0	70.2	43.9	3.110	3.164	14.72	70.1	40.5	2.659	3.174	14.70	.422	.356	0.443	0.435	0.421	0.342	28.5	32.9	.388	.388	0.89	0.54
1131.0	69.6	43.7	3.101	3.160	14.70	69.6	40.3	2.655	3.170	14.68	.419	.352	0.443	0.435	0.421	0.342	28.5	33.1	.388	.388	0.89	0.54
1136.0	70.4	43.6	3.101	3.164	14.71	70.1	40.2	2.657	3.172	14.69	.412	.348	0.000	0.000	0.421	0.342	28.6	33.1	.388	.388	0.89	0.54
1141.0	69.9	43.5	3.096	3.163	14.71	70.3	40.1	2.658	3.175	14.71	.421	.354	0.000	0.000	0.413	0.346	28.2	32.3	.388	.388	0.89	0.53
1146.0	69.7	44.6	3.090	3.160	14.70	69.8	41.3	2.654	3.171	14.69	.405	.344	0.445	0.000	0.413	0.346	27.3	31.5	.388	.388	0.89	0.53
1151.0	70.7	44.1	3.097	3.169	14.74	70.3	40.8	2.658	3.177	14.71	.422	.358	0.445	0.437	0.413	0.346	27.2	31.5	.388	.388	0.80	0.53
1156.0	69.2	44.0	3.085	3.160	14.69	69.3	40.6	2.651	3.170	14.68	.419	.353	0.445	0.437	0.413	0.346	27.2	31.7	.388	.388	0.89	0.53
1161.0	70.5	44.0	3.089	3.164	14.71	70.0	40.5	2.652	3.172	14.69	.416	.344	0.445	0.437	0.413	0.346	27.3	31.9	.388	.388	0.89	0.53
1166.0	70.1	44.0	3.090	3.165	14.72	70.6	40.4	2.656	3.178	14.71	.420	.354	0.445	0.436	0.413	0.346	27.4	32.2	.388	.388	0.89	0.53
1171.0	69.6	43.9	3.086	3.162	14.70	69.7	40.3	2.651	3.173	14.69	.417	.355	0.444	0.436	0.413	0.346	27.4	32.3	.388	.388	0.89	0.53
1176.0	70.0	44.0	3.089	3.163	14.71	69.7	40.2	2.648	3.171	14.68	.414	.347	0.444	0.436	0.413	0.346	27.5	32.5	.388	.388	0.89	0.53
1181.0	70.3	44.0	3.094	3.166	14.72	70.4	40.1	2.652	3.176	14.70	.418	.350	0.444	0.435	0.413	0.346	27.6	32.8	.388	.388	0.89	0.53
1186.0	69.9	44.1	3.094	3.164	14.71	70.1	40.0	2.651	3.176	14.70	.419	.355	0.444	0.435	0.413	0.346	27.7	33.0	.388	.388	0.89	0.53
1191.0	69.8	44.1	3.095	3.163	14.70	69.6	39.9	2.647	3.172	14.68	.417	.351	0.444	0.435	0.413	0.346	27.7	33.1	.388	.388	0.89	0.53
1196.0	70.2	44.2	3.101	3.165	14.71	70.1	39.9	2.649	3.175	14.69	.417	.348	0.444	0.164	0.409	0.345	27.8	33.2	.388	.388	0.89	0.53
1201.0	70.1	44.3	3.105	3.165	14.71	70.3	39.8	2.650	3.177	14.70	.420	.353	0.000	0.000	0.409	0.345	27.5	32.5	.388	.388	0.89	0.53
1206.0	70.0	45.6	3.108	3.164	14.71	69.8	41.1	2.648	3.174	14.69	.409	.343	0.000	0.000	0.409	0.345	26.5	31.7	.388	.388	0.89	0.53
1211.0	70.4	45.2	3.117	3.169	14.74	70.3	40.7	2.652	3.179	14.71	.425	.357	0.446	0.437	0.409	0.345	26.5	31.7	.388	.388	0.89	0.53
1216.0	69.1	45.1	3.111	3.160	14.69	69.3	40.5	2.646	3.171	14.68	.421	.352	0.446	0.437	0.409	0.345	26.5	31.8	.388	.388	0.89	0.53
1221.0	69.9	45.1	3.117	3.163	14.70	70.0	40.5	2.649	3.174	14.69	.413	.343	0.446	0.436	0.409	0.345	26.6	32.1	.388	.388	0.89	0.53

SPACE STATION OUTPUT PARAMETERS TABLE 1

	HABITAT PARAMETERS					LABORATORY PARAMETERS					CO2 REMOVAL		ACCUM INLET CO2 FLOW		ACCUM EXIT CO2 FLOW		ACCUM PRESS		O2 GENERATED		WATER FLOW	
TIME	HAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	LAB TEMP	DEW PT	CO2 PRESS	O2 PRESS	PRESS	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	O2 GEN	CO2 RED
MIN	F	F	MMHG	PSIA	PSIA	F	F	MMHG	PSIA	PSIA	PPH	PPH	PPH	PPH	PPH	PPH	PSIA	PSIA	PPH	PPH	PPH	PPH
1226.0	70.7	45.2	3.127	3.169	14.74	70.6	40.5	2.654	3.179	14.71	.422	.354	0.446	0.436	0.409	0.345	26.7	32.3	.388	.388	0.89	0.53
1231.0	69.8	45.1	3.126	3.165	14.72	69.7	40.4	2.651	3.175	14.69	.425	.355	0.446	0.436	0.409	0.345	26.8	32.5	.388	.388	0.89	0.53
1236.0	69.5	45.0	3.126	3.161	14.70	69.6	40.3	2.649	3.173	14.68	.420	.347	0.446	0.435	0.409	0.345	26.8	32.7	.388	.388	0.89	0.53
1241.0	70.3	45.1	3.133	3.166	14.72	70.4	40.3	2.655	3.178	14.70	.420	.350	0.446	0.435	0.409	0.345	26.9	32.9	.388	.388	0.89	0.53
1246.0	70.3	45.1	3.137	3.167	14.72	70.1	40.2	2.655	3.177	14.70	.425	.356	0.445	0.435	0.409	0.345	27.0	33.1	.388	.388	0.89	0.53
1251.0	69.7	45.0	3.136	3.164	14.71	69.6	40.2	2.653	3.174	14.68	.424	.352	0.445	0.434	0.409	0.345	27.1	33.3	.388	.388	0.89	0.53
1256.0	69.9	45.0	3.139	3.164	14.71	70.1	40.1	2.656	3.176	14.69	.421	.348	0.445	0.146	0.409	0.345	27.2	33.4	.388	.388	0.89	0.53
1261.0	70.3	45.0	3.145	3.167	14.72	70.3	40.1	2.659	3.178	14.70	.424	.354	0.000	0.000	0.414	0.345	26.9	32.6	.388	.388	0.89	0.53
1266.0	70.1	46.1	3.146	3.166	14.72	69.8	41.4	2.658	3.175	14.70	.415	.345	0.000	0.000	0.414	0.345	25.9	31.8	.388	.388	0.89	0.53
1271.0	70.3	45.7	3.152	3.169	14.74	70.3	40.9	2.663	3.180	14.71	.431	.359	0.448	0.437	0.414	0.345	25.8	31.9	.388	.388	0.89	0.53
1276.0	69.0	45.5	3.145	3.160	14.69	69.2	40.8	2.658	3.172	14.68	.425	.353	0.448	0.437	0.414	0.345	25.8	32.0	.388	.388	0.89	0.53
1281.0	70.0	45.5	3.151	3.164	14.71	70.1	40.8	2.662	3.175	14.69	.417	.345	0.447	0.436	0.414	0.345	25.9	32.3	.388	.388	0.89	0.53
1286.0	70.8	45.5	3.160	3.170	14.74	70.6	40.7	2.667	3.180	14.72	.427	.356	0.447	0.436	0.414	0.345	26.1	32.5	.388	.388	0.89	0.53
1291.0	69.7	45.4	3.157	3.165	14.71	69.6	40.6	2.665	3.176	14.69	.430	.357	0.447	0.435	0.414	0.345	26.1	32.6	.388	.388	0.89	0.53
1296.0	69.5	45.3	3.155	3.162	14.70	69.6	40.6	2.664	3.174	14.68	.423	.349	0.447	0.435	0.414	0.345	26.1	32.9	.388	.388	0.89	0.53
1301.0	70.4	45.2	3.161	3.167	14.72	70.5	40.5	2.670	3.179	14.71	.423	.352	0.447	0.435	0.414	0.345	26.3	33.1	.388	.388	0.89	0.53
1306.0	70.3	45.2	3.161	3.168	14.72	70.1	40.5	2.671	3.178	14.70	.429	.358	0.447	0.434	0.414	0.345	26.3	33.3	.388	.388	0.89	0.53
1311.0	69.6	45.0	3.156	3.164	14.70	69.6	40.4	2.669	3.174	14.68	.427	.353	0.447	0.434	0.414	0.345	26.4	33.5	.388	.388	0.89	0.53
1316.0	69.9	44.9	3.154	3.165	14.71	70.1	40.3	2.672	3.177	14.69	.423	.350	0.446	0.153	0.414	0.345	26.5	33.6	.388	.388	0.89	0.54
1321.0	70.3	44.8	3.154	3.168	14.72	70.3	40.3	2.675	3.179	14.70	.425	.356	0.000	0.000	0.418	0.347	26.1	32.8	.388	.388	0.89	0.54
1326.0	70.0	45.8	3.149	3.167	14.72	69.8	41.5	2.673	3.176	14.70	.415	.347	0.000	0.000	0.418	0.347	25.2	32.0	.388	.388	0.89	0.54
1331.0	70.3	45.2	3.148	3.171	14.73	70.3	41.0	2.677	3.181	14.71	.430	.361	0.449	0.437	0.418	0.347	25.1	32.0	.388	.388	0.89	0.54
1336.0	69.0	44.9	3.133	3.161	14.69	69.3	40.9	2.671	3.173	14.68	.423	.355	0.449	0.436	0.418	0.347	25.1	32.1	.388	.388	0.89	0.54
1341.0	70.1	44.8	3.131	3.166	14.70	70.1	40.8	2.674	3.176	14.69	.414	.347	0.449	0.436	0.418	0.347	25.2	32.4	.388	.388	0.89	0.54
1346.0	70.8	44.7	3.131	3.173	14.73	70.6	40.7	2.678	3.182	14.72	.423	.357	0.449	0.436	0.418	0.347	25.3	32.6	.388	.388	0.89	0.54
1351.0	69.7	44.4	3.118	3.167	14.71	69.7	40.6	2.673	3.177	14.69	.424	.358	0.448	0.435	0.418	0.347	25.3	32.8	.388	.388	0.89	0.54
1356.0	69.5	44.2	3.107	3.165	14.69	69.6	40.5	2.671	3.175	14.68	.415	.350	0.448	0.435	0.418	0.347	25.4	33.0	.388	.388	0.89	0.54
1361.0	70.4	44.0	3.103	3.170	14.72	70.4	40.4	2.674	3.180	14.70	.415	.353	0.448	0.434	0.418	0.347	25.5	33.2	.388	.388	0.89	0.54
1366.0	70.2	43.8	3.095	3.171	14.72	70.1	40.3	2.672	3.180	14.70	.419	.358	0.448	0.434	0.418	0.347	25.6	33.4	.388	.388	0.89	0.54
1371.0	69.6	43.6	3.080	3.167	14.69	69.6	40.1	2.667	3.176	14.68	.409	.353	0.448	0.434	0.418	0.347	25.6	33.6	.388	.388	0.89	0.54
1376.0	70.0	43.4	3.072	3.169	14.70	70.1	40.0	2.667	3.179	14.69	.413	.350	0.448	0.274	0.418	0.347	25.7	33.7	.388	.388	0.89	0.53
1381.0	70.1	43.2	3.062	3.171	14.71	70.3	39.9	2.667	3.181	14.70	.412	.355	0.000	0.000	0.412	0.348	25.4	33.0	.388	.388	0.89	0.53
1386.0	70.0	44.1	3.049	3.170	14.71	69.8	41.2	2.661	3.178	14.69	.401	.345	0.000	0.000	0.412	0.348	24.4	32.1	.388	.388	0.89	0.53
1391.0	70.4	43.5	3.042	3.176	14.73	70.3	40.6	2.662	3.183	14.71	.415	.359	0.450	0.436	0.412	0.348	24.3	32.2	.388	.388	0.89	0.53
1396.0	70.0	43.2	3.024	3.170	14.70	69.3	40.4	2.652	3.176	14.68	.398	.353	0.450	0.436	0.412	0.348	24.4	32.3	.388	.388	0.89	0.53
1401.0	70.4	42.9	3.015	3.174	14.71	70.1	40.3	2.651	3.179	14.69	.399	.344	0.450	0.436	0.412	0.348	24.5	32.5	.388	.388	0.89	0.53
1406.0	69.9	42.7	3.001	3.173	14.70	70.6	40.2	2.651	3.184	14.71	.401	.353	0.450	0.435	0.412	0.348	24.6	32.8	.388	.388	0.89	0.53
1411.0	68.7	42.5	2.984	3.167	14.67	69.7	40.0	2.643	3.180	14.69	.406	.354	0.450	0.435	0.412	0.348	24.6	32.9	.388	.388	0.89	0.53
1416.0	69.5	42.3	2.973	3.169	14.67	69.7	39.8	2.636	3.178	14.68	.386	.345	0.450	0.435	0.412	0.348	24.7	33.1	.388	.388	0.89	0.53
1421.0	71.2	42.2	2.973	3.182	14.73	70.5	39.7	2.636	3.184	14.70	.399	.348	0.449	0.434	0.412	0.348	24.9	33.4	.388	.388	0.89	0.53
1426.0	69.9	42.0	2.958	3.177	14.71	70.1	39.5	2.630	3.183	14.70	.403	.352	0.449	0.434	0.412	0.348	24.9	33.5	.388	.388	0.89	0.53
1431.0	69.1	41.7	2.941	3.170	14.67	69.6	39.3	2.621	3.180	14.68	.393	.347	0.449	0.434	0.412	0.348	24.9	33.7	.388	.388	0.89	0.53
1436.0	70.4	41.6	2.937	3.177	14.70	70.2	39.2	2.618	3.183	14.69	.388	.343	0.449	0.345	0.412	0.348	25.1	33.9	.388	.388	0.89	0.53

ORIGINAL PAGE IS OF POOR QUALITY

SPACE STATION OUTPUT PARAMETERS TABLE 2

	NODE 1 PARAMETERS				NODE 2 PARAMETERS				NODE 3 PARAMETERS				NODE 4 PARAMETERS			
TIME	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS
MIN	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA
1.0	72.13	49.85	2.650	3.090	72.13	49.85	2.650	3.090	73.20	49.85	2.575	3.090	73.20	49.85	2.575	3.090
6.0	76.54	48.96	2.693	3.091	76.54	48.96	2.693	3.091	75.08	48.83	2.593	3.091	75.08	48.83	2.593	3.091
11.0	75.53	47.97	2.682	3.087	75.53	47.97	2.682	3.087	74.30	47.83	2.582	3.087	74.30	47.83	2.582	3.087
16.0	75.83	47.22	2.674	3.087	75.83	47.22	2.674	3.087	74.81	47.09	2.576	3.088	74.81	47.09	2.576	3.088
21.0	76.61	46.62	2.668	3.089	76.61	46.62	2.668	3.089	75.32	46.44	2.570	3.089	75.32	46.44	2.570	3.089
26.0	76.12	45.99	2.661	3.090	76.12	45.99	2.661	3.090	74.74	45.78	2.564	3.090	74.74	45.78	2.564	3.090
31.0	75.66	45.42	2.654	3.090	75.66	45.42	2.654	3.090	74.52	45.20	2.557	3.092	74.52	45.20	2.557	3.092
36.0	76.21	44.97	2.647	3.093	76.21	44.97	2.647	3.093	75.08	44.74	2.551	3.094	75.08	44.74	2.551	3.094
41.0	76.40	44.56	2.641	3.094	76.40	44.56	2.641	3.094	75.06	44.29	2.545	3.095	75.06	44.29	2.545	3.095
46.0	75.88	44.16	2.635	3.095	75.88	44.16	2.635	3.095	74.61	43.87	2.539	3.096	74.61	43.87	2.539	3.096
51.0	75.93	43.81	2.628	3.097	75.93	43.81	2.628	3.097	74.81	43.50	2.533	3.099	74.81	43.50	2.533	3.099
56.0	76.34	43.51	2.621	3.099	76.34	43.51	2.621	3.099	75.10	43.17	2.527	3.100	75.10	43.17	2.527	3.100
61.0	76.14	43.21	2.615	3.100	76.14	43.21	2.615	3.100	74.82	42.85	2.521	3.101	74.82	42.85	2.521	3.101
66.0	75.87	43.95	2.607	3.099	75.87	43.95	2.607	3.099	74.71	43.64	2.513	3.101	74.71	43.64	2.513	3.101
71.0	76.89	43.37	2.601	3.101	76.89	43.37	2.601	3.101	75.62	42.97	2.507	3.103	75.62	42.97	2.507	3.103
76.0	75.28	43.07	2.594	3.101	75.28	43.07	2.594	3.101	73.94	42.64	2.500	3.103	73.94	42.64	2.500	3.103
81.0	76.35	42.79	2.586	3.103	76.35	42.79	2.586	3.103	74.91	42.35	2.493	3.106	74.91	42.35	2.493	3.106
86.0	76.25	42.55	2.580	3.104	76.25	42.55	2.580	3.104	75.41	42.09	2.487	3.107	75.41	42.09	2.487	3.107
91.0	75.91	42.32	2.574	3.106	75.91	42.32	2.574	3.106	74.61	41.84	2.481	3.108	74.61	41.84	2.481	3.108
96.0	75.46	42.09	2.568	3.108	75.46	42.09	2.568	3.108	74.24	41.59	2.475	3.111	74.24	41.59	2.475	3.111
101.0	76.46	41.89	2.562	3.111	76.46	41.89	2.562	3.111	75.32	41.38	2.469	3.113	75.32	41.38	2.469	3.113
106.0	76.48	41.70	2.556	3.111	76.48	41.70	2.556	3.111	75.18	41.17	2.463	3.114	75.18	41.17	2.463	3.114
111.0	75.65	41.51	2.550	3.112	75.65	41.51	2.550	3.112	74.36	40.96	2.458	3.115	74.36	40.96	2.458	3.115
116.0	75.97	41.33	2.544	3.114	75.97	41.33	2.544	3.114	74.82	40.77	2.452	3.117	74.82	40.77	2.452	3.117
121.0	76.53	41.16	2.539	3.115	76.53	41.16	2.539	3.115	75.31	40.58	2.446	3.118	75.31	40.58	2.446	3.118
126.0	76.01	42.12	2.532	3.115	76.01	42.12	2.532	3.115	74.71	41.64	2.440	3.117	74.71	41.64	2.440	3.117
131.0	76.49	41.74	2.527	3.115	76.49	41.74	2.527	3.115	75.18	41.15	2.435	3.118	75.18	41.15	2.435	3.118
136.0	75.34	41.54	2.521	3.116	75.34	41.54	2.521	3.116	74.14	40.95	2.429	3.119	74.14	40.95	2.429	3.119
141.0	76.04	41.36	2.515	3.119	76.04	41.36	2.515	3.119	74.90	40.76	2.423	3.122	74.90	40.76	2.423	3.122
146.0	76.75	41.19	2.510	3.120	76.75	41.19	2.510	3.120	75.46	40.58	2.418	3.122	75.46	40.58	2.418	3.122
151.0	75.88	41.03	2.504	3.120	75.88	41.03	2.504	3.120	74.58	40.40	2.413	3.123	74.58	40.40	2.413	3.123
156.0	75.65	40.87	2.499	3.122	75.65	40.87	2.499	3.122	74.49	40.23	2.407	3.124	74.49	40.23	2.407	3.124
161.0	76.46	40.72	2.494	3.123	76.46	40.72	2.494	3.123	75.27	40.07	2.402	3.125	75.27	40.07	2.402	3.125
166.0	76.31	40.57	2.488	3.123	76.31	40.57	2.488	3.123	75.00	39.90	2.397	3.126	75.00	39.90	2.397	3.126
171.0	75.71	40.43	2.483	3.124	75.71	40.43	2.483	3.124	74.48	39.74	2.391	3.127	74.48	39.74	2.391	3.127
176.0	76.08	40.29	2.478	3.125	76.08	40.29	2.478	3.125	74.92	39.59	2.386	3.128	74.92	39.59	2.386	3.128
181.0	76.43	40.16	2.472	3.126	76.43	40.16	2.472	3.126	75.17	39.44	2.381	3.128	75.17	39.44	2.381	3.128
186.0	75.94	41.21	2.466	3.125	75.94	41.21	2.466	3.125	74.67	40.60	2.375	3.128	74.67	40.60	2.375	3.128
191.0	76.55	40.87	2.462	3.126	76.55	40.87	2.462	3.126	75.26	40.15	2.370	3.129	75.26	40.15	2.370	3.129
196.0	75.39	40.71	2.456	3.127	75.39	40.71	2.456	3.127	74.17	39.99	2.365	3.129	74.17	39.99	2.365	3.129
201.0	75.98	40.56	2.451	3.129	75.98	40.56	2.451	3.129	74.82	39.83	2.360	3.131	74.82	39.83	2.360	3.131
206.0	76.73	40.42	2.446	3.129	76.73	40.42	2.446	3.129	75.47	39.68	2.355	3.132	75.47	39.68	2.355	3.132
211.0	75.93	40.28	2.441	3.130	75.93	40.28	2.441	3.130	74.64	39.52	2.350	3.132	74.64	39.52	2.350	3.132
216.0	75.64	40.14	2.436	3.131	75.64	40.14	2.436	3.131	74.46	39.37	2.345	3.133	74.46	39.37	2.345	3.133
221.0	76.42	40.01	2.431	3.131	76.42	40.01	2.431	3.131	75.24	39.23	2.340	3.134	75.24	39.23	2.340	3.134
226.0	76.33	39.89	2.427	3.132	76.33	39.89	2.427	3.132	75.04	39.09	2.335	3.135	75.04	39.09	2.335	3.135
231.0	75.73	39.77	2.422	3.133	75.73	39.77	2.422	3.133	74.49	38.95	2.330	3.135	74.49	38.95	2.330	3.135
236.0	76.06	39.65	2.417	3.133	76.06	39.65	2.417	3.133	74.89	38.81	2.326	3.136	74.89	38.81	2.326	3.136
241.0	76.42	39.53	2.412	3.134	76.42	39.53	2.412	3.134	75.17	38.68	2.321	3.137	75.17	38.68	2.321	3.137

SPACE STATION OUTPUT PARAMETERS TABLE 2

TIME	NODE 1 PARAMETERS				NODE 2 PARAMETERS				NODE 3 PARAMETERS				NODE 4 PARAMETERS			
	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS
MIN	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA
246.0	75.96	40.64	2.407	3.133	75.96	40.64	2.407	3.133	74.69	39.91	2.315	3.136	74.69	39.91	2.315	3.136
251.0	76.45	40.34	2.402	3.134	76.45	40.34	2.402	3.134	75.18	39.50	2.311	3.137	75.18	39.50	2.311	3.137
256.0	75.42	40.19	2.397	3.135	75.42	40.19	2.397	3.135	74.19	39.35	2.306	3.137	74.19	39.35	2.306	3.137
261.0	76.06	40.06	2.393	3.136	76.06	40.06	2.393	3.136	74.88	39.21	2.302	3.139	74.88	39.21	2.302	3.139
266.0	76.67	39.93	2.388	3.136	76.67	39.93	2.388	3.136	75.43	39.07	2.297	3.139	75.43	39.07	2.297	3.139
271.0	75.88	39.80	2.384	3.137	75.88	39.80	2.384	3.137	74.61	38.93	2.293	3.140	74.61	38.93	2.293	3.140
276.0	75.70	39.68	2.379	3.138	75.70	39.68	2.379	3.138	74.51	38.80	2.288	3.141	74.51	38.80	2.288	3.141
281.0	76.44	39.56	2.375	3.138	76.44	39.56	2.375	3.138	75.24	38.67	2.284	3.141	75.24	38.67	2.284	3.141
286.0	76.53	39.44	2.370	3.139	76.53	39.44	2.370	3.139	75.12	38.54	2.279	3.142	75.12	38.54	2.279	3.142
291.0	75.58	39.33	2.366	3.139	75.58	39.33	2.366	3.139	74.42	38.41	2.275	3.142	74.42	38.41	2.275	3.142
296.0	75.80	39.21	2.361	3.141	75.80	39.21	2.361	3.141	74.76	38.28	2.270	3.143	74.76	38.28	2.270	3.143
301.0	76.64	39.10	2.357	3.141	76.64	39.10	2.357	3.141	75.28	38.16	2.266	3.144	75.28	38.16	2.266	3.144
306.0	76.10	40.25	2.352	3.140	76.10	40.25	2.352	3.140	74.76	39.43	2.261	3.143	74.76	39.43	2.261	3.143
311.0	76.23	40.02	2.348	3.141	76.23	40.02	2.348	3.141	75.06	39.07	2.257	3.144	75.06	39.07	2.257	3.144
316.0	75.37	39.88	2.343	3.142	75.37	39.88	2.343	3.142	74.17	38.94	2.252	3.144	74.17	38.94	2.252	3.144
321.0	76.25	39.75	2.339	3.143	76.25	39.75	2.339	3.143	74.99	38.80	2.248	3.145	74.99	38.80	2.248	3.145
326.0	76.62	39.63	2.335	3.143	76.62	39.63	2.335	3.143	75.39	38.67	2.244	3.146	75.39	38.67	2.244	3.146
331.0	76.15	39.51	2.331	3.144	76.15	39.51	2.331	3.144	74.73	38.55	2.240	3.146	74.73	38.55	2.240	3.146
336.0	75.70	39.39	2.327	3.144	75.70	39.39	2.327	3.144	74.52	38.42	2.236	3.147	74.52	38.42	2.236	3.147
341.0	75.80	39.27	2.323	3.145	75.80	39.27	2.323	3.145	74.91	38.30	2.232	3.148	74.91	38.30	2.232	3.148
346.0	76.50	39.15	2.319	3.145	76.50	39.15	2.319	3.145	75.10	38.17	2.228	3.148	75.10	38.17	2.228	3.148
351.0	76.16	39.04	2.315	3.146	76.16	39.04	2.315	3.146	74.74	38.05	2.224	3.149	74.74	38.05	2.224	3.149
356.0	75.75	38.93	2.310	3.147	75.75	38.93	2.310	3.147	74.73	37.93	2.220	3.149	74.73	37.93	2.220	3.149
361.0	76.19	38.82	2.307	3.147	76.19	38.82	2.307	3.147	75.02	37.81	2.216	3.150	75.02	37.81	2.216	3.150
366.0	76.28	39.93	2.302	3.146	76.28	39.93	2.302	3.146	74.87	39.08	2.211	3.149	74.87	39.08	2.211	3.149
371.0	76.57	39.67	2.298	3.147	76.57	39.67	2.298	3.147	75.25	38.71	2.207	3.150	75.25	38.71	2.207	3.150
376.0	75.60	39.54	2.294	3.147	75.60	39.54	2.294	3.147	74.26	38.58	2.203	3.150	74.26	38.58	2.203	3.150
381.0	75.64	39.42	2.290	3.148	75.64	39.42	2.290	3.148	74.66	38.45	2.199	3.151	74.66	38.45	2.199	3.151
386.0	76.33	39.30	2.287	3.149	76.33	39.30	2.287	3.149	75.26	38.33	2.196	3.152	75.26	38.33	2.196	3.152
391.0	76.35	39.19	2.283	3.149	76.35	39.19	2.283	3.149	74.85	38.20	2.192	3.152	74.85	38.20	2.192	3.152
396.0	75.79	39.07	2.279	3.150	75.79	39.07	2.279	3.150	74.55	38.08	2.188	3.153	74.55	38.08	2.188	3.153
401.0	76.02	38.96	2.275	3.150	76.02	38.96	2.275	3.150	75.01	37.96	2.184	3.153	75.01	37.96	2.184	3.153
406.0	76.38	38.85	2.272	3.151	76.38	38.85	2.272	3.151	75.06	37.85	2.181	3.154	75.06	37.85	2.181	3.154
411.0	76.04	38.76	2.268	3.151	76.04	38.76	2.268	3.151	74.67	37.74	2.177	3.154	74.67	37.74	2.177	3.154
416.0	75.91	38.71	2.267	3.152	75.91	38.71	2.267	3.152	74.80	37.66	2.174	3.155	74.80	37.66	2.174	3.155
421.0	76.23	38.71	2.266	3.152	76.23	38.71	2.266	3.152	75.06	37.60	2.172	3.155	75.06	37.60	2.172	3.155
426.0	76.14	39.98	2.266	3.151	76.14	39.98	2.266	3.151	74.80	38.97	2.170	3.154	74.80	38.97	2.170	3.154
431.0	76.58	39.89	2.268	3.151	76.58	39.89	2.268	3.151	75.25	38.70	2.170	3.154	75.25	38.70	2.170	3.154
436.0	75.26	39.97	2.270	3.151	75.26	39.97	2.270	3.151	74.10	38.70	2.170	3.155	74.10	38.70	2.170	3.155
441.0	76.01	40.07	2.274	3.152	76.01	40.07	2.274	3.152	74.86	38.71	2.171	3.155	74.86	38.71	2.171	3.155
446.0	76.81	40.22	2.279	3.152	76.81	40.22	2.279	3.152	75.50	38.75	2.172	3.155	75.50	38.75	2.172	3.155
451.0	75.88	40.38	2.285	3.152	75.88	40.38	2.285	3.152	74.60	38.81	2.175	3.155	74.60	38.81	2.175	3.155
456.0	75.61	40.55	2.292	3.152	75.61	40.55	2.292	3.152	74.45	38.89	2.178	3.156	74.45	38.89	2.178	3.156
461.0	76.46	40.76	2.300	3.151	76.46	40.76	2.300	3.151	75.26	38.99	2.182	3.156	75.26	38.99	2.182	3.156
466.0	76.35	40.99	2.309	3.151	76.35	40.99	2.309	3.151	75.04	39.10	2.186	3.156	75.04	39.10	2.186	3.156
471.0	75.71	41.21	2.319	3.151	75.71	41.21	2.319	3.151	74.48	39.23	2.191	3.156	74.48	39.23	2.191	3.156
476.0	76.04	41.46	2.330	3.151	76.04	41.46	2.330	3.151	74.89	39.37	2.197	3.156	74.89	39.37	2.197	3.156
481.0	76.45	41.73	2.342	3.150	76.45	41.73	2.342	3.150	75.19	39.54	2.204	3.156	75.19	39.54	2.204	3.156
486.0	75.95	43.06	2.353	3.149	75.95	43.06	2.353	3.149	74.67	40.99	2.211	3.154	74.67	40.99	2.211	3.154

SPACE STATION OUTPUT PARAMETERS TABLE 2

TIME	NODE 1 PARAMETERS				NODE 2 PARAMETERS				NODE 3 PARAMETERS				NODE 4 PARAMETERS			
TIME	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS
MIN	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA
491.0	76.45	42.99	2.365	3.149	76.45	42.99	2.365	3.149	75.17	40.79	2.219	3.154	75.17	40.79	2.219	3.154
496.0	75.38	43.09	2.377	3.149	75.38	43.09	2.377	3.149	74.19	40.88	2.226	3.154	74.19	40.88	2.226	3.154
501.0	76.02	43.21	2.388	3.149	76.02	43.21	2.388	3.149	74.86	40.97	2.234	3.154	74.86	40.97	2.234	3.154
506.0	76.68	43.33	2.399	3.148	76.68	43.33	2.399	3.148	75.41	41.06	2.242	3.154	75.41	41.06	2.242	3.154
511.0	75.93	43.40	2.410	3.148	75.93	43.40	2.410	3.148	74.64	41.13	2.250	3.154	74.64	41.13	2.250	3.154
516.0	75.67	43.45	2.421	3.148	75.67	43.45	2.421	3.148	74.50	41.18	2.258	3.154	74.50	41.18	2.258	3.154
521.0	76.35	43.52	2.432	3.148	76.35	43.52	2.432	3.148	75.18	41.25	2.266	3.154	75.18	41.25	2.266	3.154
526.0	76.32	43.58	2.442	3.148	76.32	43.58	2.442	3.148	75.02	41.31	2.274	3.154	75.02	41.31	2.274	3.154
531.0	75.79	43.61	2.452	3.148	75.79	43.61	2.452	3.148	74.54	41.36	2.282	3.154	74.54	41.36	2.282	3.154
536.0	76.00	43.65	2.462	3.148	76.00	43.65	2.462	3.148	74.86	41.41	2.290	3.154	74.86	41.41	2.290	3.154
541.0	76.35	43.70	2.472	3.148	76.35	43.70	2.472	3.148	75.12	41.46	2.298	3.153	75.12	41.46	2.298	3.153
546.0	76.05	44.76	2.481	3.146	76.05	44.76	2.481	3.146	74.74	42.70	2.306	3.152	74.74	42.70	2.306	3.152
551.0	76.58	44.52	2.491	3.146	76.58	44.52	2.491	3.146	75.25	42.40	2.314	3.152	75.25	42.40	2.314	3.152
556.0	75.23	44.47	2.500	3.146	75.23	44.47	2.500	3.146	74.07	42.39	2.323	3.152	74.07	42.39	2.323	3.152
561.0	75.92	44.46	2.510	3.146	75.92	44.46	2.510	3.146	74.81	42.39	2.331	3.152	74.81	42.39	2.331	3.152
566.0	76.81	44.49	2.520	3.146	76.81	44.49	2.520	3.146	75.51	42.41	2.339	3.152	75.51	42.41	2.339	3.152
571.0	75.97	44.46	2.529	3.146	75.97	44.46	2.529	3.146	74.63	42.40	2.347	3.152	74.63	42.40	2.347	3.152
576.0	75.54	44.41	2.538	3.146	75.54	44.41	2.538	3.146	74.41	42.38	2.356	3.152	74.41	42.38	2.356	3.152
581.0	76.35	44.41	2.547	3.146	76.35	44.41	2.547	3.146	75.21	42.39	2.364	3.152	75.21	42.39	2.364	3.152
586.0	76.42	44.41	2.556	3.146	76.42	44.41	2.556	3.146	75.07	42.38	2.372	3.152	75.07	42.38	2.372	3.152
591.0	75.76	44.37	2.564	3.146	75.76	44.37	2.564	3.146	74.50	42.37	2.380	3.152	74.50	42.37	2.380	3.152
596.0	75.93	44.35	2.573	3.146	75.93	44.35	2.573	3.146	74.83	42.36	2.388	3.152	74.83	42.36	2.388	3.152
601.0	76.39	44.35	2.582	3.146	76.39	44.35	2.582	3.146	75.16	42.36	2.396	3.152	75.16	42.36	2.396	3.152
606.0	76.09	45.35	2.589	3.145	76.09	45.35	2.589	3.145	74.77	43.50	2.403	3.150	74.77	43.50	2.403	3.150
611.0	76.58	45.07	2.599	3.145	76.58	45.07	2.599	3.145	75.25	43.13	2.412	3.151	75.25	43.13	2.412	3.151
616.0	75.19	44.97	2.606	3.145	75.19	44.97	2.606	3.145	74.03	43.06	2.420	3.151	74.03	43.06	2.420	3.151
621.0	75.92	44.92	2.615	3.145	75.92	44.92	2.615	3.145	74.82	43.02	2.428	3.151	74.82	43.02	2.428	3.151
626.0	76.84	44.93	2.624	3.145	76.84	44.93	2.624	3.145	75.54	43.01	2.436	3.151	75.54	43.01	2.436	3.151
631.0	75.96	44.86	2.632	3.145	75.96	44.86	2.632	3.145	74.62	42.95	2.443	3.151	74.62	42.95	2.443	3.151
636.0	75.52	44.77	2.639	3.145	75.52	44.77	2.639	3.145	74.39	42.89	2.451	3.151	74.39	42.89	2.451	3.151
641.0	76.36	44.75	2.648	3.145	76.36	44.75	2.648	3.145	75.22	42.87	2.459	3.151	75.22	42.87	2.459	3.151
646.0	76.43	44.73	2.656	3.145	76.43	44.73	2.656	3.145	75.08	42.83	2.467	3.151	75.08	42.83	2.467	3.151
651.0	75.75	44.67	2.663	3.145	75.75	44.67	2.663	3.145	74.48	42.79	2.474	3.151	74.48	42.79	2.474	3.151
656.0	75.92	44.62	2.671	3.145	75.92	44.62	2.671	3.145	74.83	42.75	2.482	3.151	74.83	42.75	2.482	3.151
661.0	76.40	44.61	2.679	3.145	76.40	44.61	2.679	3.145	75.17	42.73	2.490	3.151	75.17	42.73	2.490	3.151
666.0	76.09	45.59	2.686	3.144	76.09	45.59	2.686	3.144	74.77	43.83	2.496	3.149	74.77	43.83	2.496	3.149
671.0	76.58	45.29	2.694	3.144	76.58	45.29	2.694	3.144	75.25	43.44	2.504	3.150	75.25	43.44	2.504	3.150
676.0	75.19	45.17	2.701	3.144	75.19	45.17	2.701	3.144	74.02	43.34	2.512	3.150	74.02	43.34	2.512	3.150
681.0	75.91	45.10	2.709	3.144	75.91	45.10	2.709	3.144	74.81	43.28	2.519	3.150	74.81	43.28	2.519	3.150
686.0	76.85	45.10	2.717	3.144	76.85	45.10	2.717	3.144	75.55	43.24	2.526	3.150	75.55	43.24	2.526	3.150
691.0	75.97	45.01	2.724	3.144	75.97	45.01	2.724	3.144	74.62	43.17	2.534	3.150	74.62	43.17	2.534	3.150
696.0	75.51	44.91	2.731	3.144	75.51	44.91	2.731	3.144	74.38	43.09	2.541	3.150	74.38	43.09	2.541	3.150
701.0	76.35	44.88	2.739	3.144	76.35	44.88	2.739	3.144	75.22	43.05	2.548	3.150	75.22	43.05	2.548	3.150
706.0	76.44	44.85	2.746	3.144	76.44	44.85	2.746	3.144	75.09	43.00	2.555	3.150	75.09	43.00	2.555	3.150
711.0	75.75	44.71	2.751	3.144	75.75	44.71	2.751	3.144	74.48	42.90	2.561	3.150	74.48	42.90	2.561	3.150
716.0	75.90	44.48	2.753	3.144	75.90	44.48	2.753	3.144	74.81	42.76	2.566	3.150	74.81	42.76	2.566	3.150
721.0	76.39	44.19	2.752	3.145	76.39	44.19	2.752	3.145	75.17	42.57	2.569	3.150	75.17	42.57	2.569	3.150
726.0	76.09	44.88	2.749	3.144	76.09	44.88	2.749	3.144	74.77	43.50	2.569	3.149	74.77	43.50	2.569	3.149
731.0	76.57	44.33	2.747	3.145	76.57	44.33	2.747	3.145	75.25	42.94	2.571	3.150	75.25	42.94	2.571	3.150

SPACE STATION OUTPUT PARAMETERS TABLE 2

TIME	NODE 1 PARAMETERS				NODE 2 PARAMETERS				NODE 3 PARAMETERS				NODE 4 PARAMETERS			
	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS
MIN	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA
736.0	75.17	44.01	2.744	3.146	75.17	44.01	2.744	3.146	74.01	42.70	2.572	3.150	74.01	42.70	2.572	3.150
741.0	75.95	43.75	2.742	3.146	75.95	43.75	2.742	3.146	74.83	42.50	2.574	3.151	74.83	42.50	2.574	3.151
746.0	76.86	43.55	2.741	3.146	76.86	43.55	2.741	3.146	75.56	42.33	2.575	3.151	75.56	42.33	2.575	3.151
751.0	75.90	43.33	2.739	3.147	75.90	43.33	2.739	3.147	74.58	42.15	2.576	3.151	74.58	42.15	2.576	3.151
756.0	75.53	43.12	2.737	3.147	75.53	43.12	2.737	3.147	74.39	41.97	2.576	3.152	74.39	41.97	2.576	3.152
761.0	76.43	42.96	2.736	3.148	76.43	42.96	2.736	3.148	75.27	41.82	2.577	3.152	75.27	41.82	2.577	3.152
766.0	76.39	42.81	2.734	3.148	76.39	42.81	2.734	3.148	75.06	41.68	2.578	3.152	75.06	41.68	2.578	3.152
771.0	75.69	42.66	2.733	3.148	75.69	42.66	2.733	3.148	74.44	41.54	2.578	3.153	74.44	41.54	2.578	3.153
776.0	75.99	42.53	2.731	3.149	75.99	42.53	2.731	3.149	74.87	41.41	2.578	3.153	74.87	41.41	2.578	3.153
781.0	76.50	42.41	2.730	3.149	76.50	42.41	2.730	3.149	75.22	41.29	2.579	3.153	75.22	41.29	2.579	3.153
786.0	75.90	43.38	2.728	3.148	75.90	43.38	2.728	3.148	74.66	42.37	2.578	3.152	74.66	42.37	2.578	3.152
791.0	76.53	43.05	2.728	3.149	76.53	43.05	2.728	3.149	75.24	41.93	2.579	3.153	75.24	41.93	2.579	3.153
796.0	75.35	42.92	2.728	3.149	75.35	42.92	2.728	3.149	74.12	41.79	2.579	3.153	74.12	41.79	2.579	3.153
801.0	76.28	42.83	2.728	3.149	76.28	42.83	2.728	3.149	74.99	41.68	2.580	3.153	74.99	41.68	2.580	3.153
806.0	76.45	42.78	2.729	3.149	76.45	42.78	2.729	3.149	75.33	41.60	2.581	3.154	75.33	41.60	2.581	3.154
811.0	75.79	42.72	2.730	3.150	75.79	42.72	2.730	3.150	74.53	41.51	2.582	3.154	74.53	41.51	2.582	3.154
816.0	75.89	42.68	2.732	3.150	75.89	42.68	2.732	3.150	74.59	41.43	2.584	3.154	74.59	41.43	2.584	3.154
821.0	76.41	42.67	2.734	3.150	76.41	42.67	2.734	3.150	75.24	41.38	2.585	3.154	75.24	41.38	2.585	3.154
826.0	76.13	42.66	2.737	3.150	76.13	42.66	2.737	3.150	74.91	41.33	2.587	3.154	74.91	41.33	2.587	3.154
831.0	75.81	42.66	2.739	3.150	75.81	42.66	2.739	3.150	74.52	41.29	2.589	3.154	74.52	41.29	2.589	3.154
836.0	76.16	42.68	2.742	3.150	76.16	42.68	2.742	3.150	74.96	41.27	2.591	3.155	74.96	41.27	2.591	3.155
841.0	76.29	42.71	2.746	3.150	76.29	42.71	2.746	3.150	75.09	41.25	2.594	3.155	75.09	41.25	2.594	3.155
846.0	75.95	43.79	2.749	3.149	75.95	43.79	2.749	3.149	74.68	42.43	2.596	3.154	74.68	42.43	2.596	3.154
851.0	76.66	43.55	2.754	3.149	76.66	43.55	2.754	3.149	75.32	42.07	2.599	3.154	75.32	42.07	2.599	3.154
856.0	75.29	43.53	2.758	3.149	75.29	43.53	2.758	3.149	74.09	42.03	2.602	3.154	74.09	42.03	2.602	3.154
861.0	75.88	43.54	2.763	3.149	75.88	43.54	2.763	3.149	74.77	42.00	2.606	3.154	74.77	42.00	2.606	3.154
866.0	76.79	43.59	2.768	3.149	76.79	43.59	2.768	3.149	75.52	42.00	2.609	3.154	75.52	42.00	2.609	3.154
871.0	76.02	43.62	2.774	3.149	76.02	43.62	2.774	3.149	74.79	41.98	2.613	3.154	74.79	41.98	2.613	3.154
876.0	75.56	43.62	2.779	3.149	75.56	43.62	2.779	3.149	74.32	41.96	2.617	3.154	74.32	41.96	2.617	3.154
881.0	76.24	43.67	2.785	3.149	76.24	43.67	2.785	3.149	75.04	41.97	2.622	3.154	75.04	41.97	2.622	3.154
886.0	76.46	43.72	2.792	3.149	76.46	43.72	2.792	3.149	75.23	41.98	2.627	3.154	75.23	41.98	2.627	3.154
891.0	75.84	43.76	2.799	3.149	75.84	43.76	2.799	3.149	74.56	41.99	2.632	3.154	74.56	41.99	2.632	3.154
896.0	75.87	43.81	2.806	3.149	75.87	43.81	2.806	3.149	74.68	42.00	2.637	3.154	74.68	42.00	2.637	3.154
901.0	76.37	43.88	2.813	3.149	76.37	43.88	2.813	3.149	75.18	42.03	2.642	3.154	75.18	42.03	2.642	3.154
906.0	76.16	44.96	2.820	3.148	76.16	44.96	2.820	3.148	74.89	43.21	2.647	3.153	74.89	43.21	2.647	3.153
911.0	76.56	44.73	2.827	3.148	76.56	44.73	2.827	3.148	75.18	42.88	2.653	3.153	75.18	42.88	2.653	3.153
916.0	75.15	44.68	2.834	3.148	75.15	44.68	2.834	3.148	73.97	42.83	2.658	3.153	73.97	42.83	2.658	3.153
921.0	75.97	44.67	2.841	3.148	75.97	44.67	2.841	3.148	74.90	42.82	2.664	3.153	74.90	42.82	2.664	3.153
926.0	76.86	44.70	2.849	3.148	76.86	44.70	2.849	3.148	75.56	42.82	2.670	3.153	75.56	42.82	2.670	3.153
931.0	75.91	44.66	2.855	3.148	75.91	44.66	2.855	3.148	74.54	42.78	2.676	3.153	74.54	42.78	2.676	3.153
936.0	75.53	44.61	2.862	3.148	75.53	44.61	2.862	3.148	74.42	42.73	2.682	3.153	74.42	42.73	2.682	3.153
941.0	76.40	44.61	2.869	3.148	76.40	44.61	2.869	3.148	75.28	42.72	2.687	3.153	75.28	42.72	2.687	3.153
946.0	76.41	44.60	2.876	3.148	76.41	44.60	2.876	3.148	75.03	42.70	2.693	3.153	75.03	42.70	2.693	3.153
951.0	75.72	44.55	2.882	3.148	75.72	44.55	2.882	3.148	74.45	42.67	2.699	3.153	74.45	42.67	2.699	3.153
956.0	75.95	44.52	2.888	3.148	75.95	44.52	2.888	3.148	74.88	42.64	2.705	3.153	74.88	42.64	2.705	3.153
961.0	76.41	44.52	2.895	3.148	76.41	44.52	2.895	3.148	75.17	42.63	2.710	3.153	75.17	42.63	2.710	3.153
966.0	76.07	45.51	2.900	3.146	76.07	45.51	2.900	3.146	74.73	43.74	2.715	3.152	74.73	43.74	2.715	3.152
971.0	76.57	45.22	2.907	3.147	76.57	45.22	2.907	3.147	75.26	43.36	2.721	3.152	75.26	43.36	2.721	3.152
976.0	75.21	45.10	2.913	3.147	75.21	45.10	2.913	3.147	74.05	43.26	2.727	3.152	74.05	43.26	2.727	3.152

SPACE STATION OUTPUT PARAMETERS TABLE 2																
	NODE 1 PARAMETERS				NODE 2 PARAMETERS				NODE 3 PARAMETERS				NODE 4 PARAMETERS			
TIME	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS
MIN	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA
981.0	75.91	45.05	2.919	3.147	75.91	45.05	2.919	3.147	74.79	43.21	2.733	3.152	74.79	43.21	2.733	3.152
986.0	76.83	45.04	2.925	3.147	76.83	45.04	2.925	3.147	75.54	43.18	2.738	3.152	75.54	43.18	2.738	3.152
991.0	75.97	44.96	2.931	3.147	75.97	44.96	2.931	3.147	74.64	43.11	2.744	3.152	74.64	43.11	2.744	3.152
996.0	75.52	44.87	2.937	3.147	75.52	44.87	2.937	3.147	74.39	43.04	2.749	3.153	74.39	43.04	2.749	3.153
1001.0	76.34	44.85	2.943	3.147	76.34	44.85	2.943	3.147	75.20	43.00	2.755	3.153	75.20	43.00	2.755	3.153
1006.0	76.44	44.81	2.949	3.147	76.43	44.81	2.949	3.147	75.09	42.96	2.761	3.153	75.09	42.96	2.761	3.153
1011.0	75.76	44.75	2.955	3.147	75.76	44.75	2.955	3.147	74.49	42.90	2.766	3.153	74.49	42.90	2.766	3.153
1016.0	75.91	44.70	2.960	3.147	75.91	44.70	2.960	3.147	74.81	42.86	2.772	3.153	74.81	42.86	2.772	3.153
1021.0	76.39	44.68	2.966	3.147	76.39	44.68	2.966	3.147	75.17	42.83	2.777	3.153	75.17	42.83	2.777	3.153
1026.0	76.10	45.63	2.970	3.146	76.10	45.63	2.970	3.146	74.78	43.91	2.781	3.151	74.78	43.91	2.781	3.151
1031.0	76.58	45.28	2.975	3.146	76.58	45.28	2.975	3.146	75.25	43.48	2.786	3.152	75.25	43.48	2.786	3.152
1036.0	75.17	45.09	2.978	3.146	75.17	45.09	2.978	3.146	74.01	43.34	2.791	3.152	74.01	43.34	2.791	3.152
1041.0	75.91	44.94	2.981	3.146	75.91	44.94	2.981	3.146	74.81	43.22	2.795	3.152	74.81	43.22	2.795	3.152
1046.0	76.86	44.82	2.983	3.147	76.86	44.82	2.983	3.147	75.56	43.12	2.798	3.152	75.56	43.12	2.798	3.152
1051.0	75.95	44.62	2.984	3.147	75.95	44.62	2.984	3.147	74.61	42.97	2.801	3.152	74.61	42.97	2.801	3.152
1056.0	75.50	44.39	2.984	3.147	75.50	44.39	2.984	3.147	74.38	42.81	2.803	3.153	74.38	42.81	2.803	3.153
1061.0	76.37	44.21	2.984	3.148	76.37	44.21	2.984	3.148	75.23	42.67	2.805	3.153	75.23	42.67	2.805	3.153
1066.0	76.43	44.01	2.983	3.148	76.43	44.01	2.983	3.148	75.08	42.52	2.806	3.153	75.08	42.52	2.806	3.153
1071.0	75.73	43.78	2.981	3.148	75.73	43.78	2.981	3.148	74.46	42.35	2.807	3.153	74.46	42.35	2.807	3.153
1076.0	75.93	43.55	2.978	3.149	75.93	43.55	2.978	3.149	74.83	42.18	2.807	3.154	74.83	42.18	2.807	3.154
1081.0	76.42	43.34	2.975	3.149	76.42	43.34	2.975	3.149	75.18	42.02	2.806	3.154	75.18	42.02	2.806	3.154
1086.0	76.08	44.16	2.971	3.149	76.08	44.16	2.971	3.149	74.76	43.01	2.805	3.153	74.76	43.01	2.805	3.153
1091.0	76.56	43.72	2.968	3.149	76.56	43.72	2.968	3.149	75.25	42.50	2.804	3.154	75.25	42.50	2.804	3.154
1096.0	75.19	43.48	2.964	3.150	75.19	43.48	2.964	3.150	74.03	42.30	2.803	3.154	74.03	42.30	2.803	3.154
1101.0	75.98	43.28	2.961	3.150	75.98	43.28	2.961	3.150	74.84	42.13	2.802	3.155	74.84	42.13	2.802	3.155
1106.0	76.83	43.13	2.958	3.151	76.83	43.13	2.958	3.151	75.54	41.98	2.801	3.155	75.54	41.98	2.801	3.155
1111.0	75.89	42.96	2.955	3.151	75.89	42.96	2.955	3.151	74.58	41.83	2.800	3.155	74.58	41.83	2.800	3.155
1116.0	75.56	42.79	2.952	3.151	75.56	42.79	2.952	3.151	74.41	41.67	2.799	3.156	74.41	41.67	2.799	3.156
1121.0	76.44	42.66	2.949	3.152	76.44	42.66	2.949	3.152	75.27	41.55	2.797	3.156	75.27	41.55	2.797	3.156
1126.0	76.37	42.54	2.946	3.152	76.37	42.54	2.946	3.152	75.04	41.42	2.796	3.156	75.04	41.42	2.796	3.156
1131.0	75.70	42.42	2.943	3.152	75.70	42.42	2.943	3.152	74.44	41.30	2.794	3.156	74.44	41.30	2.794	3.156
1136.0	76.29	42.30	2.941	3.153	76.29	42.30	2.941	3.153	75.02	41.18	2.793	3.157	75.02	41.18	2.793	3.157
1141.0	76.17	42.20	2.938	3.153	76.17	42.20	2.938	3.153	75.06	41.07	2.792	3.157	75.06	41.07	2.792	3.157
1146.0	75.76	43.18	2.935	3.152	75.76	43.18	2.935	3.152	74.58	42.17	2.789	3.156	74.58	42.17	2.789	3.156
1151.0	76.81	42.81	2.934	3.153	76.81	42.81	2.934	3.153	75.39	41.72	2.788	3.157	75.39	41.72	2.788	3.157
1156.0	75.40	42.72	2.932	3.153	75.40	42.72	2.932	3.153	74.15	41.60	2.787	3.157	74.15	41.60	2.787	3.157
1161.0	76.24	42.64	2.932	3.153	76.24	42.64	2.932	3.153	74.95	41.50	2.786	3.157	74.95	41.50	2.786	3.157
1166.0	76.41	42.61	2.931	3.153	76.41	42.61	2.931	3.153	75.32	41.43	2.786	3.158	75.32	41.43	2.786	3.158
1171.0	75.80	42.57	2.931	3.154	75.80	42.57	2.931	3.154	74.56	41.35	2.786	3.158	74.56	41.35	2.786	3.158
1176.0	75.93	42.55	2.932	3.154	75.93	42.55	2.932	3.154	74.61	41.30	2.785	3.158	74.61	41.30	2.785	3.158
1181.0	76.39	42.56	2.933	3.154	76.39	42.56	2.933	3.154	75.23	41.26	2.786	3.158	75.23	41.26	2.786	3.158
1186.0	76.12	42.57	2.934	3.154	76.12	42.57	2.934	3.154	74.91	41.22	2.786	3.158	74.91	41.22	2.786	3.158
1191.0	75.84	42.58	2.936	3.154	75.84	42.58	2.936	3.154	74.54	41.19	2.787	3.159	74.54	41.19	2.787	3.159
1196.0	76.16	42.62	2.938	3.154	76.16	42.62	2.938	3.154	74.96	41.18	2.788	3.159	74.96	41.18	2.788	3.159
1201.0	76.28	42.67	2.940	3.154	76.28	42.67	2.940	3.154	75.09	41.17	2.789	3.159	75.09	41.17	2.789	3.159
1206.0	75.96	43.75	2.942	3.153	75.96	43.75	2.942	3.153	74.69	42.36	2.789	3.158	74.69	42.36	2.789	3.158
1211.0	76.66	43.49	2.945	3.153	76.66	43.49	2.945	3.153	75.32	41.99	2.791	3.158	75.32	41.99	2.791	3.158
1216.0	75.29	43.45	2.947	3.154	75.29	43.45	2.947	3.154	74.09	41.94	2.792	3.158	74.09	41.94	2.792	3.158
1221.0	75.88	43.42	2.950	3.154	75.88	43.42	2.950	3.154	74.78	41.90	2.794	3.159	74.78	41.90	2.794	3.159

SPACE STATION OUTPUT PARAMETERS TABLE 2

TIME	NODE 1 PARAMETERS				NODE 2 PARAMETERS				NODE 3 PARAMETERS				NODE 4 PARAMETERS			
TIME	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS	TEMP	DEW PT	CO2 PRESS	O2 PRESS
MIN	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA	F	F	MMHG	PSIA
1226.0	76.79	43.43	2.953	3.154	76.79	43.43	2.953	3.154	75.52	41.87	2.796	3.159	75.52	41.87	2.796	3.159
1231.0	75.99	43.40	2.955	3.154	75.99	43.40	2.955	3.154	74.65	41.83	2.797	3.159	74.65	41.83	2.797	3.159
1236.0	75.56	43.34	2.957	3.154	75.56	43.34	2.957	3.154	74.41	41.77	2.799	3.159	74.41	41.77	2.799	3.159
1241.0	76.35	43.32	2.960	3.154	76.35	43.32	2.960	3.154	75.21	41.73	2.801	3.159	75.21	41.73	2.801	3.159
1246.0	76.41	43.30	2.962	3.154	76.41	43.30	2.962	3.154	75.08	41.70	2.802	3.159	75.08	41.70	2.802	3.159
1251.0	75.76	43.26	2.964	3.154	75.76	43.26	2.964	3.154	74.49	41.66	2.804	3.159	74.49	41.66	2.804	3.159
1256.0	75.95	43.23	2.966	3.155	75.95	43.23	2.966	3.155	74.84	41.62	2.805	3.159	74.84	41.62	2.805	3.159
1261.0	76.40	43.21	2.969	3.155	76.40	43.21	2.969	3.155	75.17	41.59	2.807	3.160	75.17	41.59	2.807	3.160
1266.0	76.07	44.22	2.970	3.153	76.07	44.22	2.970	3.153	74.76	42.74	2.808	3.158	74.76	42.74	2.808	3.158
1271.0	76.56	43.93	2.972	3.154	76.56	43.93	2.972	3.154	75.24	42.35	2.810	3.159	75.24	42.35	2.810	3.159
1276.0	75.22	43.83	2.974	3.154	75.22	43.83	2.974	3.154	74.05	42.27	2.811	3.159	74.05	42.27	2.811	3.159
1281.0	75.97	43.77	2.976	3.154	75.97	43.77	2.976	3.154	74.85	42.20	2.813	3.159	74.85	42.20	2.813	3.159
1286.0	76.82	43.74	2.978	3.154	76.82	43.74	2.978	3.154	75.53	42.15	2.815	3.159	75.53	42.15	2.815	3.159
1291.0	75.91	43.67	2.980	3.155	75.91	43.67	2.980	3.155	74.59	42.09	2.817	3.160	74.59	42.09	2.817	3.160
1296.0	75.56	43.57	2.982	3.155	75.56	43.57	2.982	3.155	74.42	42.01	2.818	3.160	74.42	42.01	2.818	3.160
1301.0	76.40	43.51	2.983	3.155	76.40	43.51	2.983	3.155	75.25	41.95	2.820	3.160	75.25	41.95	2.820	3.160
1306.0	76.38	43.43	2.983	3.155	76.38	43.43	2.983	3.155	75.05	41.88	2.820	3.160	75.05	41.88	2.820	3.160
1311.0	75.72	43.32	2.983	3.155	75.72	43.32	2.983	3.155	74.46	41.79	2.821	3.160	74.46	41.79	2.821	3.160
1316.0	75.98	43.21	2.982	3.156	75.98	43.21	2.982	3.156	74.86	41.70	2.821	3.161	74.86	41.70	2.821	3.161
1321.0	76.41	43.12	2.980	3.156	76.41	43.12	2.980	3.156	75.17	41.62	2.821	3.161	75.17	41.62	2.821	3.161
1326.0	76.04	44.04	2.977	3.155	76.04	44.04	2.977	3.155	74.73	42.70	2.819	3.160	74.73	42.70	2.819	3.160
1331.0	76.55	43.65	2.975	3.156	76.55	43.65	2.975	3.156	75.24	42.25	2.819	3.160	75.24	42.25	2.819	3.160
1336.0	75.22	43.46	2.971	3.156	75.22	43.46	2.971	3.156	74.05	42.11	2.817	3.161	74.05	42.11	2.817	3.161
1341.0	75.97	43.30	2.968	3.157	75.97	43.30	2.968	3.157	74.84	41.97	2.815	3.161	74.84	41.97	2.815	3.161
1346.0	76.82	43.16	2.964	3.157	76.82	43.16	2.964	3.157	75.53	41.85	2.813	3.161	75.53	41.85	2.813	3.161
1351.0	75.89	42.99	2.959	3.157	75.89	42.99	2.959	3.157	74.59	41.71	2.811	3.162	74.59	41.71	2.811	3.162
1356.0	75.56	42.80	2.953	3.158	75.56	42.80	2.953	3.158	74.41	41.56	2.808	3.162	74.41	41.56	2.808	3.162
1361.0	76.44	42.64	2.947	3.158	76.44	42.64	2.947	3.158	75.26	41.42	2.804	3.162	75.26	41.42	2.804	3.162
1366.0	76.37	42.47	2.941	3.159	76.37	42.47	2.941	3.159	75.05	41.28	2.800	3.163	75.05	41.28	2.800	3.163
1371.0	75.69	42.29	2.934	3.159	75.69	42.29	2.934	3.159	74.45	41.14	2.796	3.163	74.45	41.14	2.796	3.163
1376.0	76.05	42.11	2.927	3.160	76.05	42.11	2.927	3.160	74.89	40.99	2.791	3.164	74.89	40.99	2.791	3.164
1381.0	76.27	41.92	2.919	3.160	76.27	41.92	2.919	3.160	75.10	40.84	2.786	3.164	75.10	40.84	2.786	3.164
1386.0	76.01	42.80	2.909	3.160	76.01	42.80	2.909	3.160	74.72	41.89	2.780	3.163	74.72	41.89	2.780	3.163
1391.0	76.66	42.34	2.901	3.161	76.66	42.34	2.901	3.161	75.31	41.38	2.774	3.164	75.31	41.38	2.774	3.164
1396.0	75.86	42.10	2.892	3.161	75.86	42.10	2.892	3.161	74.37	41.19	2.768	3.165	74.37	41.19	2.768	3.165
1401.0	76.30	41.87	2.883	3.162	76.30	41.87	2.883	3.162	75.00	40.99	2.762	3.165	75.00	40.99	2.762	3.165
1406.0	76.28	41.68	2.874	3.162	76.28	41.68	2.874	3.162	75.24	40.82	2.755	3.166	75.24	40.82	2.755	3.166
1411.0	75.29	41.50	2.864	3.163	75.29	41.50	2.864	3.163	74.29	40.65	2.749	3.166	74.29	40.65	2.749	3.166
1416.0	75.52	41.31	2.855	3.164	75.52	41.31	2.855	3.164	74.41	40.48	2.742	3.167	74.41	40.48	2.742	3.167
1421.0	76.97	41.14	2.847	3.165	76.97	41.14	2.847	3.165	75.53	40.32	2.735	3.168	75.53	40.32	2.735	3.168
1426.0	76.20	40.97	2.838	3.166	76.20	40.97	2.838	3.166	74.95	40.15	2.728	3.168	74.95	40.15	2.728	3.168
1431.0	75.34	40.80	2.829	3.166	75.34	40.80	2.829	3.166	74.27	39.99	2.721	3.169	74.27	39.99	2.721	3.169
1436.0	76.29	40.64	2.821	3.167	76.29	40.64	2.821	3.167	75.04	39.84	2.715	3.169	75.04	39.84	2.715	3.169
1440.0	76.71	40.52	2.815	3.167	76.71	40.52	2.815	3.167	75.36	39.71	2.709	3.170	75.36	39.71	2.709	3.170

SPACE STATION OUTPUT PARAMETERS TABLE 3

	H2 PRODUCTION		H2 VENTED		H2 TO CO2 REDUCTION		CO2 REMOVAL EXIT CO2 PRESS		HEAT EXCHANGER EXIT CO2 PRESS		O2 ADDITION		O2 ACCUM
TIME	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HABITAT	LAB	O2
MIN	PPH	PPH	PPH	PPH	PPH	PPH	MM HG	MM HG	MM HG	MM HG	PPH	PPH	PSIA
1.0	0.039	0.039	0.039	0.039	0.000	0.000	0.994	0.903	2.807	2.549	0.00	0.00	1052.4
6.0	0.039	0.039	0.039	0.039	0.000	0.000	0.930	0.822	2.625	2.322	0.44	0.38	1051.9
11.0	0.044	0.044	0.044	0.044	0.000	0.000	0.921	0.804	2.600	2.273	0.59	0.56	1049.3
16.0	0.044	0.044	0.044	0.044	0.000	0.000	0.899	0.793	2.540	2.242	0.57	1.43	1048.5
21.0	0.044	0.044	0.044	0.044	0.000	0.000	0.906	0.807	2.561	2.281	0.50	0.51	1049.8
26.0	0.044	0.044	0.044	0.044	0.000	0.000	0.914	0.805	2.581	2.276	0.58	0.53	1048.3
31.0	0.044	0.044	0.044	0.044	0.000	0.000	0.900	0.789	2.544	2.231	1.97	1.97	1045.2
36.0	0.044	0.044	0.044	0.044	0.000	0.000	0.891	0.791	2.519	2.237	0.58	1.14	1043.9
41.0	0.044	0.044	0.044	0.044	0.000	0.000	0.900	0.798	2.544	2.256	0.57	0.55	1043.9
46.0	0.044	0.044	0.044	0.044	0.000	0.000	0.898	0.789	2.537	2.231	1.99	1.01	1041.5
51.0	0.044	0.044	0.044	0.044	0.000	0.000	0.886	0.781	2.504	2.209	1.63	2.25	1037.9
56.0	0.044	0.044	0.044	0.044	0.000	0.000	0.887	0.788	2.507	2.228	0.59	0.60	1037.3
61.0	0.044	0.044	0.016	0.019	0.028	0.024	0.842	0.746	2.517	2.225	1.32	0.59	1036.1
66.0	0.044	0.044	0.016	0.019	0.028	0.024	0.787	0.687	2.474	2.167	2.17	1.85	1032.2
71.0	0.044	0.044	0.016	0.019	0.028	0.024	0.896	0.797	2.533	2.254	0.44	0.46	1032.9
76.0	0.044	0.044	0.016	0.019	0.028	0.024	0.883	0.783	2.497	2.215	2.98	2.84	1028.1
81.0	0.044	0.044	0.016	0.019	0.028	0.024	0.885	0.744	2.503	2.107	3.60	0.58	1024.5
86.0	0.044	0.044	0.016	0.019	0.028	0.024	0.892	0.776	2.521	2.197	0.49	0.52	1021.5
91.0	0.044	0.044	0.016	0.019	0.028	0.024	0.883	0.783	2.498	2.215	0.56	2.01	1019.9
96.0	0.044	0.044	0.016	0.019	0.028	0.024	0.861	0.755	2.436	2.138	3.48	3.07	1014.9
101.0	0.044	0.044	0.016	0.019	0.028	0.024	0.860	0.757	2.434	2.143	0.57	0.58	1013.8
106.0	0.044	0.044	0.016	0.019	0.028	0.024	0.874	0.775	2.470	2.193	0.51	0.52	1013.1
111.0	0.044	0.044	0.016	0.019	0.028	0.024	0.865	0.763	2.448	2.159	1.91	1.37	1010.6
116.0	0.044	0.044	0.016	0.019	0.028	0.024	0.852	0.747	2.411	2.115	1.48	1.52	1007.7
121.0	0.044	0.044	0.017	0.020	0.027	0.024	0.817	0.726	2.435	2.158	0.53	0.54	1008.0
126.0	0.044	0.044	0.017	0.020	0.027	0.024	0.768	0.683	2.421	2.136	0.58	0.57	1006.7
131.0	0.044	0.044	0.017	0.020	0.027	0.024	0.870	0.768	2.459	2.174	0.48	0.46	1006.9
136.0	0.044	0.044	0.017	0.020	0.027	0.024	0.854	0.752	2.415	2.130	1.88	2.26	1003.4
141.0	0.044	0.044	0.017	0.020	0.027	0.024	0.836	0.735	2.365	2.081	1.07	1.17	1001.2
146.0	0.044	0.044	0.017	0.020	0.027	0.024	0.855	0.755	2.419	2.138	0.49	0.47	1001.9
151.0	0.044	0.044	0.017	0.020	0.027	0.024	0.856	0.755	2.421	2.137	0.57	0.55	999.6
156.0	0.044	0.044	0.017	0.020	0.027	0.024	0.837	0.735	2.369	2.082	1.82	1.86	997.2
161.0	0.044	0.044	0.017	0.020	0.027	0.024	0.840	0.741	2.376	2.098	0.54	0.54	997.8
166.0	0.044	0.044	0.017	0.020	0.027	0.024	0.849	0.750	2.403	2.124	0.53	0.51	996.9
171.0	0.044	0.044	0.017	0.020	0.027	0.024	0.840	0.738	2.378	2.092	1.23	0.76	995.1
176.0	0.044	0.044	0.017	0.020	0.027	0.024	0.831	0.731	2.353	2.071	0.59	0.59	994.4
181.0	0.044	0.044	0.017	0.020	0.026	0.023	0.798	0.707	2.375	2.099	0.53	0.52	994.5
186.0	0.044	0.044	0.017	0.020	0.026	0.023	0.756	0.672	2.353	2.066	0.59	0.56	993.3
191.0	0.044	0.044	0.017	0.020	0.026	0.023	0.847	0.746	2.395	2.113	0.46	0.43	993.7
196.0	0.044	0.044	0.017	0.020	0.026	0.023	0.833	0.733	2.356	2.077	1.24	1.32	990.9
201.0	0.044	0.044	0.017	0.020	0.026	0.023	0.815	0.714	2.307	2.022	1.05	0.75	989.5
206.0	0.044	0.044	0.017	0.020	0.026	0.023	0.833	0.733	2.356	2.077	0.48	0.46	990.2
211.0	0.044	0.044	0.017	0.020	0.026	0.023	0.834	0.735	2.360	2.082	0.55	0.53	988.2
216.0	0.044	0.044	0.017	0.020	0.026	0.023	0.817	0.716	2.313	2.029	1.56	1.26	986.6
221.0	0.044	0.044	0.017	0.020	0.026	0.023	0.819	0.720	2.317	2.038	0.54	0.53	987.3
226.0	0.044	0.044	0.017	0.020	0.026	0.023	0.828	0.730	2.343	2.067	0.51	0.49	986.5
231.0	0.044	0.044	0.017	0.020	0.026	0.023	0.820	0.720	2.321	2.039	0.81	0.59	985.0
236.0	0.044	0.044	0.017	0.020	0.026	0.023	0.812	0.711	2.297	2.015	0.59	0.58	984.8
241.0	0.044	0.044	0.018	0.021	0.026	0.023	0.779	0.689	2.317	2.042	0.52	0.51	985.0

SPACE STATION OUTPUT PARAMETERS TABLE 3

	H2 PRODUCTION		H2 VENTED		H2 TO CO2 REDUCTION		CO2 REMOVAL EXIT CO2 PRESS		HEAT EXCHANGER EXIT CO2 PRESS		O2 ADDITION		O2 ACCUM
TIME	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HABITAT	LAB	O2
MIN	PPH	PPH	PPH	PPH	PPH	PPH	MM HG	MM HG	MM HG	MM HG	PPH	PPH	PSIA
246.0	0.044	0.044	0.018	0.021	0.026	0.023	0.744	0.660	2.303	2.013	0.57	0.53	983.8
251.0	0.044	0.044	0.018	0.021	0.026	0.023	0.826	0.726	2.337	2.058	0.45	0.43	984.0
256.0	0.044	0.044	0.018	0.021	0.026	0.023	0.811	0.714	2.296	2.022	0.93	0.95	981.7
261.0	0.044	0.044	0.018	0.021	0.026	0.023	0.798	0.696	2.258	1.974	0.60	0.58	981.4
266.0	0.044	0.044	0.018	0.021	0.026	0.023	0.814	0.715	2.304	2.025	0.48	0.45	981.9
271.0	0.044	0.044	0.018	0.021	0.026	0.023	0.814	0.715	2.303	2.027	0.54	0.53	979.9
276.0	0.044	0.044	0.018	0.021	0.026	0.023	0.798	0.698	2.259	1.977	1.20	0.70	979.0
281.0	0.044	0.044	0.018	0.021	0.026	0.023	0.802	0.702	2.269	1.990	0.53	0.51	979.9
286.0	0.044	0.044	0.018	0.021	0.026	0.023	0.813	0.711	2.301	2.015	0.51	0.47	979.8
291.0	0.044	0.044	0.018	0.021	0.026	0.023	0.808	0.701	2.288	1.988	0.60	0.56	977.2
296.0	0.044	0.044	0.018	0.021	0.026	0.023	0.785	0.694	2.223	1.966	0.58	1.54	976.2
301.0	0.044	0.044	0.019	0.022	0.025	0.022	0.760	0.672	2.257	1.992	0.52	0.47	977.6
306.0	0.044	0.044	0.019	0.022	0.025	0.022	0.731	0.648	2.267	1.964	0.56	0.46	976.2
311.0	0.044	0.044	0.019	0.022	0.025	0.022	0.809	0.709	2.288	2.007	0.45	0.44	975.5
316.0	0.044	0.044	0.019	0.022	0.025	0.022	0.788	0.696	2.231	1.971	0.70	1.21	973.7
321.0	0.044	0.044	0.019	0.022	0.025	0.022	0.782	0.680	2.213	1.927	0.59	0.53	974.6
326.0	0.044	0.044	0.019	0.022	0.025	0.022	0.799	0.698	2.262	1.977	0.47	0.42	974.4
331.0	0.044	0.044	0.019	0.022	0.025	0.022	0.804	0.698	2.276	1.978	0.54	0.47	973.5
336.0	0.044	0.044	0.019	0.022	0.025	0.022	0.798	0.681	2.258	1.931	0.88	0.55	972.0
341.0	0.044	0.044	0.019	0.022	0.025	0.022	0.777	0.686	2.200	1.943	0.52	1.11	971.1
346.0	0.044	0.044	0.019	0.022	0.025	0.022	0.781	0.694	2.210	1.965	0.51	0.49	972.6
351.0	0.044	0.044	0.019	0.022	0.025	0.022	0.792	0.685	2.243	1.942	0.58	0.45	971.7
356.0	0.044	0.044	0.019	0.022	0.025	0.022	0.783	0.679	2.217	1.924	0.57	0.57	970.0
361.0	0.044	0.044	0.019	0.022	0.025	0.022	0.737	0.656	2.191	1.943	0.52	0.56	970.6
366.0	0.044	0.044	0.019	0.022	0.025	0.022	0.709	0.635	2.197	1.915	0.56	0.47	970.8
371.0	0.044	0.044	0.019	0.022	0.025	0.022	0.796	0.693	2.252	1.963	0.43	0.35	970.4
376.0	0.044	0.044	0.019	0.022	0.025	0.022	0.791	0.680	2.238	1.928	0.60	0.53	968.7
381.0	0.044	0.044	0.019	0.022	0.025	0.022	0.776	0.663	2.197	1.880	0.59	0.58	967.6
386.0	0.044	0.044	0.019	0.022	0.025	0.022	0.767	0.681	2.171	1.930	0.46	0.54	968.4
391.0	0.044	0.044	0.019	0.022	0.025	0.022	0.778	0.683	2.202	1.935	0.52	0.45	968.6
396.0	0.044	0.044	0.019	0.022	0.025	0.022	0.777	0.667	2.199	1.890	0.66	0.51	967.0
401.0	0.044	0.044	0.019	0.022	0.025	0.022	0.766	0.670	2.169	1.898	0.52	0.56	966.7
406.0	0.044	0.044	0.019	0.022	0.025	0.022	0.769	0.678	2.178	1.922	0.50	0.49	967.3
411.0	0.044	0.044	0.019	0.022	0.025	0.022	0.774	0.670	2.191	1.900	0.57	0.48	966.5
416.0	0.044	0.044	0.019	0.022	0.025	0.022	0.769	0.664	2.176	1.881	0.56	0.54	965.6
421.0	0.044	0.044	0.019	0.023	0.024	0.021	0.731	0.642	2.171	1.902	0.51	0.52	965.8
426.0	0.044	0.044	0.019	0.023	0.024	0.021	0.705	0.623	2.169	1.876	0.55	0.48	965.6
431.0	0.044	0.044	0.019	0.023	0.024	0.021	0.787	0.678	2.228	1.921	0.43	0.34	965.7
436.0	0.044	0.044	0.019	0.023	0.024	0.021	0.776	0.666	2.196	1.888	0.58	0.57	963.0
441.0	0.044	0.044	0.019	0.023	0.024	0.021	0.761	0.651	2.154	1.844	0.58	0.54	964.2
446.0	0.044	0.044	0.019	0.023	0.024	0.021	0.786	0.669	2.223	1.896	0.45	0.35	965.2
451.0	0.044	0.044	0.019	0.023	0.024	0.021	0.792	0.671	2.241	1.901	0.51	0.43	963.1
456.0	0.044	0.044	0.019	0.023	0.024	0.021	0.781	0.655	2.209	1.856	0.59	0.53	962.4
461.0	0.044	0.044	0.019	0.023	0.024	0.021	0.788	0.660	2.230	1.871	0.50	0.42	963.8
466.0	0.044	0.044	0.019	0.023	0.024	0.021	0.804	0.671	2.274	1.901	0.48	0.36	963.2
471.0	0.044	0.044	0.019	0.023	0.024	0.021	0.804	0.663	2.273	1.879	0.56	0.45	961.8
476.0	0.044	0.044	0.019	0.023	0.024	0.021	0.802	0.657	2.269	1.863	0.54	0.44	962.2
481.0	0.044	0.044	0.019	0.023	0.024	0.021	0.773	0.639	2.311	1.894	0.48	0.34	962.7
486.0	0.044	0.044	0.019	0.023	0.024	0.021	0.760	0.625	2.313	1.872	0.52	0.38	961.7

SPACE STATION OUTPUT PARAMETERS TABLE 3													
	H_2 PRODUCTION		H_2 VENTED		H_2 TO CO_2 REDUCTION		CO_2 REMOVAL EXIT CO_2 PRESS		HEAT EXCHANGER EXIT CO_2 PRESS		O_2 ADDITION		O_2 ACCUM
TIME	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HABITAT	LAB	O_2
MIN	PPH	PPH	PPH	PPH	PPH	PPH	MM HG	MM HG	MM HG	MM HG	PPH	PPH	PSIA
491.0	0.044	0.044	0.019	0.023	0.024	0.021	0.838	0.678	2.369	1.920	0.41	0.26	962.1
496.0	0.044	0.044	0.019	0.023	0.024	0.021	0.832	0.669	2.351	1.894	0.55	0.44	960.1
501.0	0.044	0.044	0.019	0.023	0.024	0.021	0.825	0.657	2.331	1.860	0.54	0.41	961.5
506.0	0.044	0.044	0.019	0.023	0.024	0.021	0.845	0.676	2.389	1.914	0.42	0.27	962.3
511.0	0.044	0.044	0.019	0.023	0.024	0.021	0.853	0.679	2.411	1.923	0.48	0.33	960.8
516.0	0.044	0.044	0.019	0.023	0.024	0.021	0.846	0.666	2.391	1.887	0.55	0.41	960.3
521.0	0.044	0.044	0.019	0.023	0.024	0.021	0.851	0.673	2.405	1.907	0.46	0.34	961.4
526.0	0.044	0.044	0.019	0.023	0.024	0.021	0.864	0.685	2.443	1.939	0.44	0.29	961.1
531.0	0.044	0.044	0.019	0.023	0.024	0.021	0.866	0.679	2.446	1.923	0.52	0.36	960.1
536.0	0.044	0.044	0.019	0.023	0.024	0.021	0.863	0.676	2.439	1.914	0.50	0.37	960.3
541.0	0.044	0.044	0.017	0.023	0.026	0.021	0.822	0.656	2.463	1.947	0.44	0.31	960.8
546.0	0.044	0.044	0.017	0.023	0.026	0.021	0.788	0.639	2.464	1.928	0.48	0.32	960.4
551.0	0.044	0.044	0.017	0.023	0.026	0.021	0.894	0.701	2.526	1.985	0.36	0.20	960.9
556.0	0.044	0.044	0.017	0.023	0.026	0.021	0.885	0.691	2.501	1.958	0.52	0.42	958.4
561.0	0.044	0.044	0.017	0.023	0.026	0.021	0.869	0.677	2.457	1.918	0.51	0.41	959.9
566.0	0.044	0.044	0.017	0.023	0.026	0.021	0.893	0.701	2.523	1.984	0.37	0.23	961.4
571.0	0.044	0.044	0.017	0.023	0.026	0.021	0.902	0.706	2.549	1.997	0.44	0.29	959.7
576.0	0.044	0.044	0.017	0.023	0.026	0.021	0.892	0.690	2.520	1.955	0.53	0.41	958.9
581.0	0.044	0.044	0.017	0.023	0.026	0.021	0.893	0.699	2.523	1.979	0.43	0.33	960.3
586.0	0.044	0.044	0.017	0.023	0.026	0.021	0.908	0.713	2.566	2.018	0.40	0.26	960.4
591.0	0.044	0.044	0.017	0.023	0.026	0.021	0.910	0.706	2.570	2.000	0.50	0.34	959.1
596.0	0.044	0.044	0.017	0.023	0.026	0.021	0.904	0.702	2.553	1.988	0.48	0.38	959.2
601.0	0.044	0.044	0.016	0.022	0.028	0.022	0.859	0.682	2.575	2.027	0.41	0.30	960.0
606.0	0.044	0.044	0.016	0.022	0.028	0.022	0.819	0.658	2.578	2.011	0.46	0.30	959.7
611.0	0.044	0.044	0.016	0.022	0.028	0.022	0.935	0.731	2.639	2.069	0.33	0.19	960.1
616.0	0.044	0.044	0.016	0.022	0.028	0.022	0.924	0.720	2.609	2.039	0.51	0.42	957.6
621.0	0.044	0.044	0.016	0.022	0.028	0.022	0.906	0.705	2.559	1.997	0.49	0.40	959.2
626.0	0.044	0.044	0.016	0.022	0.028	0.022	0.931	0.731	2.628	2.068	0.35	0.23	960.7
631.0	0.044	0.044	0.016	0.022	0.028	0.022	0.940	0.735	2.654	2.082	0.43	0.28	958.9
636.0	0.044	0.044	0.016	0.022	0.028	0.022	0.927	0.719	2.620	2.036	0.52	0.41	958.1
641.0	0.044	0.044	0.016	0.022	0.028	0.022	0.928	0.728	2.621	2.062	0.42	0.33	959.6
646.0	0.044	0.044	0.016	0.022	0.028	0.022	0.944	0.743	2.666	2.103	0.39	0.26	959.7
651.0	0.044	0.044	0.016	0.022	0.028	0.022	0.944	0.736	2.667	2.083	0.49	0.34	958.4
656.0	0.044	0.044	0.016	0.022	0.028	0.022	0.937	0.731	2.648	2.069	0.47	0.38	958.6
661.0	0.044	0.044	0.015	0.021	0.029	0.023	0.890	0.710	2.669	2.111	0.40	0.30	959.4
666.0	0.044	0.044	0.015	0.021	0.029	0.023	0.848	0.680	2.671	2.094	0.45	0.30	959.1
671.0	0.044	0.044	0.015	0.021	0.029	0.023	0.968	0.761	2.733	2.152	0.32	0.19	959.5
676.0	0.044	0.044	0.015	0.021	0.029	0.023	0.956	0.750	2.700	2.122	0.50	0.42	956.9
681.0	0.044	0.044	0.015	0.021	0.029	0.023	0.937	0.733	2.647	2.076	0.49	0.40	958.6
686.0	0.044	0.044	0.015	0.021	0.029	0.023	0.962	0.760	2.718	2.149	0.35	0.23	960.1
691.0	0.044	0.044	0.015	0.021	0.029	0.023	0.971	0.765	2.743	2.164	0.43	0.28	958.3
696.0	0.044	0.044	0.015	0.021	0.029	0.023	0.958	0.747	2.707	2.115	0.52	0.41	957.5
701.0	0.044	0.044	0.015	0.021	0.029	0.023	0.958	0.756	2.707	2.140	0.42	0.33	959.0
706.0	0.044	0.044	0.015	0.021	0.029	0.023	0.974	0.771	2.752	2.183	0.39	0.26	959.1
711.0	0.044	0.044	0.015	0.021	0.029	0.023	0.974	0.764	2.750	2.162	0.49	0.35	957.8
716.0	0.044	0.044	0.015	0.021	0.029	0.023	0.963	0.758	2.720	2.147	0.47	0.39	957.9
721.0	0.044	0.044	0.014	0.020	0.030	0.024	0.910	0.736	2.727	2.188	0.40	0.33	958.7
726.0	0.044	0.044	0.014	0.020	0.030	0.024	0.857	0.702	2.716	2.170	0.45	0.34	958.4
731.0	0.044	0.044	0.014	0.020	0.030	0.024	0.979	0.787	2.765	2.228	0.33	0.22	958.7

SPACE STATION OUTPUT PARAMETERS TABLE 3

	H2 PRODUCTION		H2 VENTED		H2 TO CO2 REDUCTION		CO2 REMOVAL EXIT CO2 PRESS		HEAT EXCHANGER EXIT CO2 PRESS		O2 ADDITION		O2 ACCUM
TIME	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HABITAT	LAB	O2
MIN	PPH	PPH	PPH	PPH	PPH	PPH	MM HG	MM HG	MM HG	MM HG	PPH	PPH	PSIA
736.0	0.044	0.044	0.014	0.020	0.030	0.024	0.961	0.775	2.715	2.193	0.51	0.47	956.1
741.0	0.044	0.044	0.014	0.020	0.030	0.024	0.937	0.757	2.648	2.142	0.50	0.46	957.8
746.0	0.044	0.044	0.014	0.020	0.030	0.024	0.961	0.783	2.714	2.216	0.36	0.28	959.2
751.0	0.044	0.044	0.014	0.020	0.030	0.024	0.964	0.787	2.724	2.227	0.44	0.36	957.1
756.0	0.044	0.044	0.014	0.020	0.030	0.024	0.944	0.767	2.669	2.172	0.53	0.49	956.5
761.0	0.044	0.044	0.014	0.020	0.030	0.024	0.944	0.775	2.668	2.195	0.43	0.39	958.0
766.0	0.044	0.044	0.014	0.020	0.030	0.024	0.957	0.789	2.704	2.234	0.40	0.34	957.7
771.0	0.044	0.044	0.014	0.020	0.030	0.024	0.950	0.779	2.686	2.207	0.51	0.44	956.3
776.0	0.044	0.044	0.014	0.020	0.030	0.024	0.939	0.772	2.655	2.187	0.49	0.46	956.6
781.0	0.044	0.044	0.014	0.019	0.030	0.024	0.899	0.749	2.688	2.226	0.42	0.35	957.4
786.0	0.044	0.044	0.014	0.019	0.030	0.024	0.841	0.712	2.667	2.201	0.47	0.42	956.2
791.0	0.044	0.044	0.014	0.019	0.030	0.024	0.959	0.797	2.710	2.257	0.35	0.28	956.9
796.0	0.044	0.044	0.014	0.019	0.030	0.024	0.946	0.784	2.673	2.220	0.52	0.48	954.7
801.0	0.044	0.044	0.014	0.019	0.030	0.024	0.940	0.766	2.658	2.168	0.51	0.43	956.8
806.0	0.044	0.044	0.014	0.019	0.030	0.024	0.953	0.790	2.693	2.236	0.38	0.34	956.2
811.0	0.044	0.044	0.014	0.019	0.030	0.024	0.947	0.793	2.676	2.243	0.46	0.44	955.0
816.0	0.044	0.044	0.014	0.019	0.030	0.024	0.939	0.773	2.654	2.189	0.54	0.44	955.4
821.0	0.044	0.044	0.014	0.019	0.030	0.024	0.948	0.782	2.680	2.213	0.44	0.37	955.8
826.0	0.044	0.044	0.014	0.019	0.030	0.024	0.953	0.794	2.692	2.247	0.42	0.39	955.0
831.0	0.044	0.044	0.014	0.019	0.030	0.024	0.947	0.784	2.676	2.218	0.52	0.44	954.6
836.0	0.044	0.044	0.014	0.019	0.030	0.024	0.948	0.778	2.679	2.204	0.49	0.40	955.0
841.0	0.044	0.044	0.014	0.019	0.029	0.024	0.902	0.754	2.699	2.240	0.43	0.37	954.8
846.0	0.044	0.044	0.014	0.019	0.029	0.024	0.856	0.719	2.680	2.211	0.49	0.40	954.3
851.0	0.044	0.044	0.014	0.019	0.029	0.024	0.972	0.802	2.745	2.270	0.35	0.24	955.2
856.0	0.044	0.044	0.014	0.019	0.029	0.024	0.962	0.790	2.718	2.237	0.52	0.46	952.6
861.0	0.044	0.044	0.014	0.019	0.029	0.024	0.943	0.770	2.665	2.181	0.52	0.46	953.8
866.0	0.044	0.044	0.014	0.019	0.029	0.024	0.966	0.795	2.729	2.251	0.38	0.28	955.2
871.0	0.044	0.044	0.014	0.019	0.029	0.024	0.975	0.802	2.755	2.270	0.45	0.34	953.5
876.0	0.044	0.044	0.014	0.019	0.029	0.024	0.963	0.788	2.721	2.230	0.53	0.45	952.7
881.0	0.044	0.044	0.014	0.019	0.029	0.024	0.964	0.781	2.723	2.211	0.49	0.37	953.9
886.0	0.044	0.044	0.014	0.019	0.029	0.024	0.979	0.800	2.767	2.264	0.40	0.30	953.9
891.0	0.044	0.044	0.014	0.019	0.029	0.024	0.980	0.798	2.769	2.260	0.48	0.38	952.7
896.0	0.044	0.044	0.014	0.019	0.029	0.024	0.974	0.786	2.752	2.224	0.52	0.41	952.8
901.0	0.044	0.044	0.014	0.019	0.030	0.025	0.926	0.759	2.774	2.254	0.44	0.34	953.4
906.0	0.044	0.044	0.014	0.019	0.030	0.025	0.887	0.732	2.777	2.251	0.45	0.33	953.1
911.0	0.044	0.044	0.014	0.019	0.030	0.025	1.007	0.816	2.843	2.308	0.35	0.21	953.5
916.0	0.044	0.044	0.014	0.019	0.030	0.025	0.994	0.798	2.809	2.259	0.54	0.44	950.9
921.0	0.044	0.044	0.014	0.019	0.030	0.025	0.975	0.782	2.756	2.213	0.50	0.42	952.5
926.0	0.044	0.044	0.014	0.019	0.030	0.025	1.002	0.812	2.831	2.298	0.36	0.24	954.0
931.0	0.044	0.044	0.014	0.019	0.030	0.025	1.011	0.813	2.856	2.302	0.46	0.30	952.1
936.0	0.044	0.044	0.014	0.019	0.030	0.025	0.997	0.792	2.817	2.243	0.54	0.43	951.3
941.0	0.044	0.044	0.014	0.019	0.030	0.025	0.998	0.805	2.820	2.279	0.42	0.34	952.8
946.0	0.044	0.044	0.014	0.019	0.030	0.025	1.015	0.819	2.866	2.319	0.41	0.27	952.8
951.0	0.044	0.044	0.014	0.019	0.030	0.025	1.014	0.808	2.865	2.288	0.51	0.36	951.5
956.0	0.044	0.044	0.014	0.019	0.030	0.025	1.006	0.804	2.843	2.275	0.48	0.39	951.6
961.0	0.044	0.044	0.013	0.019	0.031	0.025	0.956	0.780	2.866	2.320	0.41	0.32	952.4
966.0	0.044	0.044	0.013	0.019	0.031	0.025	0.911	0.747	2.866	2.294	0.47	0.32	952.0
971.0	0.044	0.044	0.013	0.019	0.031	0.025	1.038	0.833	2.930	2.356	0.34	0.20	952.4
976.0	0.044	0.044	0.013	0.019	0.031	0.025	1.025	0.821	2.894	2.323	0.51	0.43	949.9

SPACE STATION OUTPUT PARAMETERS TABLE 3

TIME	H2 PRODUCTION		H2 VENTED		H2 TO CO2 REDUCTION		CO2 REMOVAL EXIT CO2 PRESS		HEAT EXCHANGER EXIT CO2 PRESS		O2 ADDITION		O2 ACCUM
TIME	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HABITAT	LAB	O2
MIN	PPH	PPH	PPH	PPH	PPH	PPH	MM HG	MM HG	MM HG	MM HG	PPH	PPH	PSIA
981.0	0.044	0.044	0.013	0.019	0.031	0.025	1.004	0.802	2.837	2.270	0.51	0.42	951.5
986.0	0.044	0.044	0.013	0.019	0.031	0.025	1.031	0.829	2.910	2.345	0.37	0.24	953.0
991.0	0.044	0.044	0.013	0.019	0.031	0.025	1.040	0.834	2.935	2.360	0.44	0.30	951.2
996.0	0.044	0.044	0.013	0.019	0.031	0.025	1.025	0.815	2.896	2.307	0.53	0.42	950.4
1001.0	0.044	0.044	0.013	0.019	0.031	0.025	1.025	0.823	2.894	2.329	0.43	0.35	951.8
1006.0	0.044	0.044	0.013	0.019	0.031	0.025	1.041	0.839	2.940	2.374	0.40	0.27	951.8
1011.0	0.044	0.044	0.013	0.019	0.031	0.025	1.041	0.831	2.940	2.351	0.50	0.36	950.5
1016.0	0.044	0.044	0.013	0.019	0.031	0.025	1.032	0.824	2.915	2.331	0.49	0.39	950.6
1021.0	0.044	0.044	0.012	0.018	0.032	0.026	0.979	0.798	2.935	2.373	0.41	0.32	951.4
1026.0	0.044	0.044	0.012	0.018	0.032	0.026	0.931	0.762	2.935	2.353	0.46	0.32	951.1
1031.0	0.044	0.044	0.012	0.018	0.032	0.026	1.062	0.854	2.998	2.416	0.34	0.20	951.4
1036.0	0.049	0.049	0.017	0.023	0.032	0.026	1.047	0.840	2.956	2.378	0.52	0.44	948.9
1041.0	0.049	0.049	0.017	0.023	0.032	0.026	1.023	0.821	2.890	2.323	0.51	0.43	950.5
1046.0	0.044	0.044	0.012	0.018	0.032	0.026	1.049	0.850	2.961	2.404	0.36	0.25	952.0
1051.0	0.044	0.044	0.012	0.018	0.032	0.026	1.055	0.854	2.980	2.416	0.44	0.32	950.2
1056.0	0.049	0.049	0.017	0.023	0.032	0.026	1.037	0.833	2.929	2.358	0.54	0.45	949.4
1061.0	0.044	0.044	0.012	0.018	0.032	0.026	1.033	0.842	2.919	2.383	0.43	0.38	950.9
1066.0	0.044	0.044	0.012	0.018	0.032	0.026	1.047	0.858	2.958	2.427	0.41	0.31	950.9
1071.0	0.049	0.049	0.017	0.023	0.032	0.026	1.042	0.848	2.944	2.399	0.51	0.41	949.5
1076.0	0.049	0.049	0.017	0.023	0.032	0.026	1.029	0.840	2.906	2.377	0.49	0.44	949.7
1081.0	0.044	0.044	0.011	0.017	0.032	0.026	0.976	0.814	2.919	2.420	0.42	0.37	950.5
1086.0	0.049	0.049	0.016	0.022	0.032	0.026	0.913	0.774	2.907	2.395	0.48	0.38	950.0
1091.0	0.044	0.044	0.011	0.017	0.032	0.026	1.048	0.868	2.959	2.455	0.35	0.26	950.3
1096.0	0.049	0.049	0.016	0.022	0.032	0.026	1.028	0.853	2.905	2.414	0.53	0.51	947.8
1101.0	0.049	0.049	0.016	0.022	0.032	0.026	1.004	0.832	2.837	2.355	0.52	0.49	949.5
1106.0	0.044	0.044	0.011	0.017	0.032	0.026	1.029	0.859	2.907	2.432	0.38	0.31	950.7
1111.0	0.049	0.049	0.016	0.022	0.032	0.026	1.032	0.863	2.915	2.441	0.46	0.40	948.7
1116.0	0.049	0.049	0.016	0.022	0.032	0.026	1.011	0.840	2.857	2.378	0.55	0.51	948.2
1121.0	0.049	0.049	0.016	0.022	0.032	0.026	1.012	0.848	2.859	2.401	0.45	0.42	949.6
1126.0	0.049	0.049	0.016	0.022	0.032	0.026	1.025	0.863	2.895	2.441	0.43	0.37	949.3
1131.0	0.049	0.049	0.016	0.022	0.032	0.026	1.017	0.851	2.874	2.408	0.53	0.47	948.0
1136.0	0.049	0.049	0.016	0.022	0.032	0.026	1.016	0.842	2.872	2.385	0.51	0.44	949.2
1141.0	0.049	0.049	0.017	0.022	0.032	0.027	0.965	0.817	2.886	2.426	0.44	0.41	948.2
1146.0	0.049	0.049	0.017	0.022	0.032	0.027	0.899	0.776	2.824	2.394	0.50	0.50	947.7
1151.0	0.049	0.049	0.017	0.022	0.032	0.027	1.026	0.867	2.898	2.454	0.37	0.27	949.4
1156.0	0.049	0.049	0.017	0.022	0.032	0.027	1.018	0.854	2.877	2.416	0.54	0.47	946.7
1161.0	0.049	0.049	0.017	0.022	0.032	0.027	1.010	0.832	2.853	2.354	0.54	0.48	948.7
1166.0	0.049	0.049	0.017	0.022	0.032	0.027	1.019	0.857	2.879	2.425	0.40	0.37	948.0
1171.0	0.049	0.049	0.017	0.022	0.032	0.027	1.011	0.860	2.857	2.433	0.47	0.47	947.0
1176.0	0.049	0.049	0.017	0.022	0.032	0.027	1.004	0.839	2.837	2.375	0.56	0.46	947.5
1181.0	0.049	0.049	0.017	0.022	0.032	0.027	1.014	0.846	2.865	2.395	0.46	0.39	947.9
1186.0	0.049	0.049	0.017	0.022	0.032	0.027	1.017	0.859	2.874	2.431	0.44	0.41	947.1
1191.0	0.049	0.049	0.017	0.022	0.032	0.027	1.011	0.848	2.856	2.400	0.53	0.46	946.8
1196.0	0.049	0.049	0.017	0.022	0.032	0.027	1.012	0.841	2.861	2.382	0.51	0.42	947.2
1201.0	0.049	0.049	0.017	0.022	0.031	0.027	0.963	0.814	2.880	2.418	0.45	0.39	947.0
1206.0	0.049	0.049	0.017	0.022	0.031	0.027	0.915	0.778	2.857	2.386	0.50	0.42	946.6
1211.0	0.049	0.049	0.017	0.022	0.031	0.027	1.036	0.865	2.926	2.449	0.37	0.25	947.5
1216.0	0.049	0.049	0.017	0.022	0.031	0.027	1.025	0.852	2.894	2.411	0.54	0.48	945.0
1221.0	0.049	0.049	0.017	0.022	0.031	0.027	1.003	0.830	2.834	2.349	0.54	0.48	946.2

SPACE STATION OUTPUT PARAMETERS TABLE 3

	H2 PRODUCTION		H2 VENTED		H2 TO CO2 REDUCTION		CO2 REMOVAL EXIT CO2 PRESS		HEAT EXCHANGER EXIT CO2 PRESS		O2 ADDITION		O2 ACCUM
TIME	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HAB1	LAB1	HABITAT	LAB	O2
MIN	PPH	PPH	PPH	PPH	PPH	PPH	MM HG	MM HG	MM HG	MM HG	PPH	PPH	PSIA
1226.0	0.049	0.049	0.017	0.022	0.031	0.027	1.026	0.856	2.899	2.424	0.40	0.31	947.6
1231.0	0.049	0.049	0.017	0.022	0.031	0.027	1.034	0.860	2.922	2.435	0.47	0.36	946.0
1236.0	0.049	0.049	0.017	0.022	0.031	0.027	1.020	0.839	2.881	2.375	0.56	0.48	945.2
1241.0	0.049	0.049	0.017	0.022	0.031	0.027	1.019	0.846	2.879	2.395	0.46	0.40	946.5
1246.0	0.049	0.049	0.017	0.022	0.031	0.027	1.034	0.861	2.920	2.437	0.43	0.34	946.5
1251.0	0.049	0.049	0.017	0.022	0.031	0.027	1.031	0.851	2.913	2.408	0.53	0.42	945.3
1256.0	0.049	0.049	0.017	0.022	0.031	0.027	1.022	0.842	2.889	2.385	0.51	0.44	945.5
1261.0	0.049	0.049	0.017	0.022	0.032	0.027	0.972	0.816	2.909	2.425	0.44	0.37	946.1
1266.0	0.049	0.049	0.017	0.022	0.032	0.027	0.923	0.783	2.903	2.399	0.49	0.38	945.7
1271.0	0.049	0.049	0.017	0.022	0.032	0.027	1.050	0.869	2.964	2.460	0.37	0.25	946.1
1276.0	0.049	0.049	0.017	0.022	0.032	0.027	1.034	0.854	2.921	2.418	0.54	0.49	943.7
1281.0	0.049	0.049	0.017	0.022	0.032	0.027	1.013	0.834	2.863	2.362	0.53	0.46	945.3
1286.0	0.049	0.049	0.017	0.022	0.032	0.027	1.039	0.862	2.935	2.439	0.39	0.29	946.6
1291.0	0.049	0.049	0.017	0.022	0.032	0.027	1.045	0.865	2.952	2.447	0.47	0.36	944.8
1296.0	0.049	0.049	0.017	0.022	0.032	0.027	1.028	0.843	2.904	2.387	0.55	0.48	944.1
1301.0	0.049	0.049	0.017	0.022	0.032	0.027	1.028	0.852	2.904	2.411	0.45	0.39	945.5
1306.0	0.049	0.049	0.017	0.022	0.032	0.027	1.042	0.866	2.943	2.452	0.43	0.33	945.4
1311.0	0.049	0.049	0.017	0.022	0.032	0.027	1.037	0.855	2.929	2.420	0.53	0.43	944.1
1316.0	0.049	0.049	0.017	0.022	0.032	0.027	1.025	0.847	2.897	2.399	0.51	0.45	944.4
1321.0	0.049	0.049	0.016	0.022	0.032	0.027	0.975	0.822	2.916	2.441	0.44	0.38	945.1
1326.0	0.049	0.049	0.016	0.022	0.032	0.027	0.919	0.785	2.903	2.412	0.49	0.39	944.5
1331.0	0.049	0.049	0.016	0.022	0.032	0.027	1.047	0.874	2.956	2.473	0.37	0.26	945.0
1336.0	0.049	0.049	0.016	0.022	0.032	0.027	1.028	0.859	2.904	2.432	0.54	0.50	942.6
1341.0	0.049	0.049	0.016	0.022	0.032	0.027	1.003	0.838	2.835	2.373	0.53	0.48	944.2
1346.0	0.049	0.049	0.016	0.022	0.032	0.027	1.028	0.865	2.903	2.448	0.40	0.31	945.4
1351.0	0.049	0.049	0.016	0.022	0.032	0.027	1.030	0.868	2.909	2.455	0.47	0.40	943.5
1356.0	0.049	0.049	0.016	0.022	0.032	0.027	1.007	0.845	2.845	2.393	0.56	0.51	942.9
1361.0	0.049	0.049	0.016	0.022	0.032	0.027	1.006	0.853	2.843	2.414	0.46	0.42	944.4
1366.0	0.049	0.049	0.016	0.022	0.032	0.027	1.018	0.867	2.876	2.453	0.44	0.37	944.0
1371.0	0.049	0.049	0.016	0.022	0.032	0.027	1.008	0.855	2.848	2.420	0.54	0.47	942.7
1376.0	0.049	0.049	0.016	0.022	0.032	0.027	1.000	0.846	2.827	2.395	0.52	0.46	943.2
1381.0	0.049	0.049	0.017	0.022	0.032	0.027	0.946	0.819	2.824	2.433	0.45	0.44	943.2
1386.0	0.049	0.049	0.017	0.022	0.032	0.027	0.880	0.780	2.792	2.401	0.50	0.45	943.0
1391.0	0.049	0.049	0.017	0.022	0.032	0.027	1.009	0.869	2.850	2.459	0.38	0.29	943.7
1396.0	0.049	0.049	0.017	0.022	0.032	0.027	1.003	0.853	2.835	2.415	0.55	0.48	942.7
1401.0	0.049	0.049	0.017	0.022	0.032	0.027	1.006	0.832	2.843	2.355	0.54	0.41	943.3
1406.0	0.049	0.049	0.017	0.022	0.032	0.027	1.005	0.856	2.841	2.422	0.41	0.43	942.3
1411.0	0.049	0.049	0.017	0.022	0.032	0.027	0.986	0.857	2.788	2.424	0.49	0.53	940.0
1416.0	0.049	0.049	0.017	0.022	0.032	0.027	0.934	0.834	2.642	2.361	0.57	1.48	939.9
1421.0	0.049	0.049	0.017	0.022	0.032	0.027	0.966	0.841	2.732	2.382	0.47	0.36	942.7
1426.0	0.049	0.049	0.017	0.022	0.032	0.027	0.980	0.853	2.770	2.415	0.45	0.39	940.4
1431.0	0.049	0.049	0.017	0.022	0.032	0.027	0.953	0.839	2.694	2.375	0.55	0.59	938.6
1436.0	0.049	0.049	0.017	0.022	0.032	0.027	0.940	0.830	2.659	2.350	0.53	0.51	940.6
1440.0	0.049	0.049	0.017	0.022	0.032	0.027	0.960	0.842	2.716	2.383	0.46	0.38	941.0

SPACE STATION OUTPUT PARAMETERS TABLE 4					
	HEAT EXCHANGER CONDENSATE		CO2 REDUCTION CONDENSATE		TOTAL COND
TIME	HAB	LAB	HAB1	LAB1	
MIN	PPH	PPH	PPH	PPH	PPH
1.0	2.79	2.79	0.000	0.000	5.57
6.0	2.28	2.06	0.000	0.000	4.34
11.0	1.86	1.37	0.000	0.000	3.23
16.0	1.28	1.01	0.000	0.000	2.29
21.0	1.29	1.10	0.000	0.000	2.39
26.0	1.19	0.90	0.000	0.000	2.09
31.0	0.93	0.57	0.000	0.000	1.50
36.0	0.74	0.52	0.000	0.000	1.25
41.0	0.73	0.48	0.000	0.000	1.21
46.0	0.62	0.35	0.000	0.000	0.96
51.0	0.48	0.28	0.000	0.000	0.76
56.0	0.43	0.27	0.000	0.000	0.70
61.0	0.39	0.23	0.252	0.223	1.10
66.0	6.67	6.04	0.252	0.223	13.18
71.0	0.41	0.26	0.252	0.223	1.15
76.0	0.38	0.20	0.252	0.223	1.06
81.0	0.35	0.12	0.252	0.223	0.94
86.0	0.27	0.14	0.252	0.223	0.89
91.0	0.28	0.11	0.252	0.223	0.86
96.0	0.24	0.07	0.252	0.223	0.79
101.0	0.22	0.06	0.252	0.223	0.76
106.0	0.21	0.03	0.252	0.223	0.72
111.0	0.19	0.02	0.252	0.223	0.69
116.0	0.16	0.03	0.252	0.223	0.67
121.0	0.15	0.00	0.247	0.219	0.62
126.0	5.71	5.23	0.247	0.219	11.40
131.0	0.19	0.02	0.247	0.219	0.68
136.0	0.20	0.02	0.247	0.219	0.68
141.0	0.16	0.03	0.247	0.219	0.66
146.0	0.16	0.00	0.247	0.219	0.62
151.0	0.13	0.00	0.247	0.219	0.60
156.0	0.12	0.00	0.247	0.219	0.59
161.0	0.11	0.00	0.247	0.219	0.58
166.0	0.08	0.00	0.247	0.219	0.55
171.0	0.08	0.00	0.247	0.219	0.54
176.0	0.07	0.00	0.247	0.219	0.54
181.0	0.05	0.00	0.241	0.213	0.51
186.0	5.46	4.91	0.241	0.213	10.83
191.0	0.09	0.00	0.241	0.213	0.55
196.0	0.11	0.00	0.241	0.213	0.57
201.0	0.10	0.00	0.241	0.213	0.55
206.0	0.08	0.00	0.241	0.213	0.54
211.0	0.05	0.00	0.241	0.213	0.51
216.0	0.06	0.00	0.241	0.213	0.52
221.0	0.05	0.00	0.241	0.213	0.51
226.0	0.02	0.00	0.241	0.213	0.47
231.0	0.02	0.00	0.241	0.213	0.48
236.0	0.02	0.00	0.241	0.213	0.48
241.0	0.00	0.00	0.235	0.207	0.44

SPACE STATION OUTPUT PARAMETERS TABLE 4

	HEAT EXCHANGER CONDENSATE		CO2 REDUCTION CONDENSATE		TOTAL COND
TIME	HAB	LAB	HAB1	LAB1	
MIN	PPH	PPH	PPH	PPH	PPH
246.0	5.22	4.69	0.235	0.207	10.35
251.0	0.05	0.00	0.235	0.207	0.49
256.0	0.07	0.00	0.235	0.207	0.51
261.0	0.06	0.00	0.235	0.207	0.50
266.0	0.04	0.00	0.235	0.207	0.48
271.0	0.02	0.00	0.235	0.207	0.46
276.0	0.03	0.00	0.235	0.207	0.47
281.0	0.02	0.00	0.235	0.207	0.46
286.0	0.00	0.00	0.235	0.207	0.44
291.0	0.00	0.00	0.235	0.207	0.44
296.0	0.01	0.00	0.235	0.207	0.45
301.0	0.00	0.00	0.230	0.202	0.43
306.0	4.72	4.55	0.230	0.202	9.71
311.0	0.01	0.00	0.230	0.202	0.45
316.0	0.05	0.00	0.230	0.202	0.48
321.0	0.05	0.00	0.230	0.202	0.48
326.0	0.00	0.00	0.230	0.202	0.43
331.0	0.00	0.00	0.230	0.202	0.43
336.0	0.00	0.00	0.230	0.202	0.43
341.0	0.02	0.00	0.230	0.202	0.45
346.0	0.00	0.00	0.230	0.202	0.43
351.0	0.00	0.00	0.230	0.202	0.43
356.0	0.00	0.00	0.230	0.202	0.43
361.0	0.00	0.00	0.226	0.197	0.42
366.0	5.03	4.48	0.226	0.197	9.94
371.0	0.00	0.00	0.226	0.197	0.42
376.0	0.00	0.00	0.226	0.197	0.42
381.0	0.01	0.00	0.226	0.197	0.43
386.0	0.02	0.00	0.226	0.197	0.45
391.0	0.00	0.00	0.226	0.197	0.42
396.0	0.00	0.00	0.226	0.197	0.42
401.0	0.00	0.00	0.226	0.197	0.42
406.0	0.00	0.00	0.226	0.197	0.42
411.0	0.00	0.00	0.226	0.197	0.42
416.0	0.00	0.00	0.226	0.197	0.42
421.0	0.00	0.00	0.221	0.193	0.41
426.0	5.12	4.41	0.221	0.193	9.94
431.0	0.00	0.00	0.221	0.193	0.41
436.0	0.09	0.00	0.221	0.193	0.51
441.0	0.11	0.00	0.221	0.193	0.52
446.0	0.14	0.00	0.221	0.193	0.55
451.0	0.16	0.00	0.221	0.193	0.57
456.0	0.20	0.00	0.221	0.193	0.61
461.0	0.25	0.00	0.221	0.193	0.66
466.0	0.29	0.00	0.221	0.193	0.71
471.0	0.34	0.00	0.221	0.193	0.75
476.0	0.37	0.00	0.221	0.193	0.78
481.0	0.46	0.00	0.224	0.190	0.88
486.0	6.55	4.57	0.224	0.190	11.54

SPACE STATION OUTPUT PARAMETERS TABLE 4

	HEAT EXCHANGER CONDENSATE		CO2 REDUCTION CONDENSATE		TOTAL COND
TIME	HAB	LAB	HAB1	LAB1	
MIN	PPH	PPH	PPH	PPH	PPH
491.0	0.76	0.00	0.224	0.190	1.17
496.0	0.83	0.00	0.224	0.190	1.24
501.0	0.76	0.00	0.224	0.190	1.17
506.0	0.96	0.00	0.224	0.190	1.37
511.0	1.00	0.00	0.224	0.190	1.42
516.0	0.94	0.00	0.224	0.190	1.35
521.0	0.98	0.00	0.224	0.190	1.39
526.0	1.07	0.00	0.224	0.190	1.48
531.0	1.06	0.00	0.224	0.190	1.47
536.0	1.00	0.00	0.224	0.190	1.42
541.0	1.06	0.00	0.240	0.192	1.49
546.0	7.32	5.04	0.240	0.192	12.79
551.0	1.25	0.00	0.240	0.192	1.68
556.0	1.25	0.02	0.240	0.192	1.71
561.0	0.99	0.04	0.240	0.192	1.47
566.0	1.29	0.02	0.240	0.192	1.74
571.0	1.31	0.01	0.240	0.192	1.75
576.0	1.18	0.04	0.240	0.192	1.65
581.0	1.15	0.04	0.240	0.192	1.63
586.0	1.28	0.02	0.240	0.192	1.73
591.0	1.25	0.04	0.240	0.192	1.72
596.0	1.14	0.05	0.240	0.192	1.62
601.0	1.20	0.03	0.253	0.199	1.68
606.0	7.43	5.39	0.253	0.199	13.28
611.0	1.38	0.09	0.253	0.199	1.92
616.0	1.37	0.08	0.253	0.199	1.91
621.0	1.07	0.07	0.253	0.199	1.59
626.0	1.39	0.08	0.253	0.199	1.92
631.0	1.41	0.07	0.253	0.199	1.93
636.0	1.25	0.06	0.253	0.199	1.77
641.0	1.22	0.07	0.253	0.199	1.74
646.0	1.36	0.06	0.253	0.199	1.87
651.0	1.32	0.06	0.253	0.199	1.83
656.0	1.19	0.06	0.253	0.199	1.70
661.0	1.25	0.06	0.263	0.207	1.78
666.0	7.48	5.56	0.263	0.207	13.52
671.0	1.44	0.13	0.263	0.207	2.04
676.0	1.42	0.12	0.263	0.207	2.00
681.0	1.10	0.10	0.263	0.207	1.66
686.0	1.43	0.11	0.263	0.207	2.01
691.0	1.44	0.10	0.263	0.207	2.02
696.0	1.28	0.09	0.263	0.207	1.84
701.0	1.24	0.09	0.263	0.207	1.80
706.0	1.38	0.09	0.263	0.207	1.94
711.0	1.31	0.08	0.263	0.207	1.86
716.0	1.10	0.07	0.263	0.207	1.64
721.0	1.02	0.07	0.272	0.215	1.58
726.0	7.11	5.60	0.272	0.215	13.19
731.0	0.91	0.13	0.272	0.215	1.53

SPACE STATION OUTPUT PARAMETERS TABLE 4

TIME	HEAT EXCHANGER CONDENSATE		CO2 REDUCTION CONDENSATE		TOTAL COND
TIME	HAB	LAB	HAB1	LAB1	
MIN	PPH	PPH	PPH	PPH	PPH
736.0	0.85	0.11	0.272	0.215	1.45
741.0	0.59	0.08	0.272	0.215	1.16
746.0	0.71	0.09	0.272	0.215	1.29
751.0	0.64	0.07	0.272	0.215	1.20
756.0	0.53	0.05	0.272	0.215	1.08
761.0	0.50	0.05	0.272	0.215	1.04
766.0	0.49	0.03	0.272	0.215	1.01
771.0	0.45	0.02	0.272	0.215	0.96
776.0	0.39	0.05	0.272	0.215	0.92
781.0	0.40	0.01	0.271	0.221	0.91
786.0	6.34	5.34	0.271	0.221	12.17
791.0	0.48	0.05	0.271	0.221	1.03
796.0	0.49	0.04	0.271	0.221	1.03
801.0	0.46	0.03	0.271	0.221	0.99
806.0	0.47	0.02	0.271	0.221	0.99
811.0	0.48	0.02	0.271	0.221	1.00
816.0	0.45	0.03	0.271	0.221	0.98
821.0	0.50	0.01	0.271	0.221	1.00
826.0	0.51	0.00	0.271	0.221	1.00
831.0	0.51	0.00	0.271	0.221	1.00
836.0	0.52	0.00	0.271	0.221	1.01
841.0	0.55	0.00	0.269	0.223	1.05
846.0	6.82	5.24	0.269	0.223	12.55
851.0	0.71	0.02	0.269	0.223	1.23
856.0	0.78	0.03	0.269	0.223	1.30
861.0	0.64	0.03	0.269	0.223	1.16
866.0	0.84	0.02	0.269	0.223	1.35
871.0	0.88	0.00	0.269	0.223	1.37
876.0	0.83	0.04	0.269	0.223	1.36
881.0	0.84	0.04	0.269	0.223	1.37
886.0	0.96	0.01	0.269	0.223	1.46
891.0	0.97	0.01	0.269	0.223	1.47
896.0	0.93	0.02	0.269	0.223	1.44
901.0	1.00	0.01	0.274	0.225	1.52
906.0	7.23	5.26	0.274	0.225	12.99
911.0	1.23	0.06	0.274	0.225	1.79
916.0	1.25	0.07	0.274	0.225	1.81
921.0	0.99	0.06	0.274	0.225	1.55
926.0	1.31	0.06	0.274	0.225	1.87
931.0	1.33	0.06	0.274	0.225	1.88
936.0	1.19	0.05	0.274	0.225	1.74
941.0	1.18	0.06	0.274	0.225	1.73
946.0	1.31	0.05	0.274	0.225	1.86
951.0	1.28	0.05	0.274	0.225	1.83
956.0	1.16	0.05	0.274	0.225	1.71
961.0	1.23	0.05	0.283	0.229	1.79
966.0	7.46	5.54	0.283	0.229	13.51
971.0	1.42	0.12	0.283	0.229	2.05
976.0	1.40	0.11	0.283	0.229	2.02

SPACE STATION OUTPUT PARAMETERS TABLE 4

	HEAT EXCHANGER CONDENSATE		CO2 REDUCTION CONDENSATE		TOTAL COND
TIME	HAB	LAB	HAB1	LAB1	
MIN	PPH	PPH	PPH	PPH	PPH
981.0	1.09	0.09	0.283	0.229	1.69
986.0	1.41	0.11	0.283	0.229	2.03
991.0	1.43	0.10	0.283	0.229	2.04
996.0	1.27	0.08	0.283	0.229	1.87
1001.0	1.24	0.08	0.283	0.229	1.83
1006.0	1.37	0.08	0.283	0.229	1.97
1011.0	1.34	0.07	0.283	0.229	1.92
1016.0	1.21	0.07	0.283	0.229	1.79
1021.0	1.26	0.07	0.291	0.235	1.86
1026.0	7.50	5.60	0.291	0.235	13.63
1031.0	1.41	0.14	0.291	0.235	2.08
1036.0	1.36	0.13	0.291	0.235	2.01
1041.0	1.02	0.10	0.291	0.235	1.64
1046.0	1.28	0.12	0.291	0.235	1.92
1051.0	1.22	0.10	0.291	0.235	1.85
1056.0	1.03	0.08	0.291	0.235	1.64
1061.0	0.94	0.08	0.291	0.235	1.55
1066.0	0.97	0.08	0.291	0.235	1.57
1071.0	0.87	0.06	0.291	0.235	1.46
1076.0	0.71	0.06	0.291	0.235	1.29
1081.0	0.68	0.05	0.295	0.240	1.26
1086.0	6.70	5.52	0.295	0.240	12.75
1091.0	0.65	0.10	0.295	0.240	1.29
1096.0	0.66	0.09	0.295	0.240	1.28
1101.0	0.47	0.06	0.295	0.240	1.07
1106.0	0.56	0.06	0.295	0.240	1.16
1111.0	0.52	0.04	0.295	0.240	1.09
1116.0	0.44	0.04	0.295	0.240	1.01
1121.0	0.43	0.03	0.295	0.240	0.99
1126.0	0.42	0.01	0.295	0.240	0.96
1131.0	0.40	0.02	0.295	0.240	0.95
1136.0	0.38	0.01	0.295	0.240	0.93
1141.0	0.37	0.00	0.290	0.243	0.90
1146.0	6.71	5.28	0.290	0.243	12.52
1151.0	0.44	0.03	0.290	0.243	1.01
1156.0	0.45	0.03	0.290	0.243	1.01
1161.0	0.43	0.02	0.290	0.243	0.98
1166.0	0.44	0.02	0.290	0.243	0.99
1171.0	0.44	0.00	0.290	0.243	0.98
1176.0	0.43	0.01	0.290	0.243	0.97
1181.0	0.47	0.00	0.290	0.243	1.00
1186.0	0.49	0.00	0.290	0.243	1.02
1191.0	0.49	0.00	0.290	0.243	1.02
1196.0	0.51	0.00	0.290	0.243	1.05
1201.0	0.55	0.00	0.287	0.242	1.08
1206.0	6.82	5.20	0.287	0.242	12.55
1211.0	0.69	0.01	0.287	0.242	1.24
1216.0	0.76	0.02	0.287	0.242	1.31
1221.0	0.60	0.02	0.287	0.242	1.15

SPACE STATION OUTPUT PARAMETERS TABLE 4

	HEAT EXCHANGER CONDENSATE		CO2 REDUCTION CONDENSATE		TOTAL COND
TIME	HAB	LAB	HAB1	LAB1	
MIN	PPH	PPH	PPH	PPH	PPH
1226.0	0.78	0.03	0.287	0.242	1.33
1231.0	0.78	0.00	0.287	0.242	1.31
1236.0	0.72	0.03	0.287	0.242	1.28
1241.0	0.71	0.02	0.287	0.242	1.26
1246.0	0.77	0.00	0.287	0.242	1.30
1251.0	0.76	0.00	0.287	0.242	1.29
1256.0	0.70	0.00	0.287	0.242	1.23
1261.0	0.73	0.00	0.290	0.242	1.26
1266.0	6.84	5.27	0.290	0.242	12.64
1271.0	0.85	0.04	0.290	0.242	1.42
1276.0	0.88	0.04	0.290	0.242	1.46
1281.0	0.69	0.04	0.290	0.242	1.26
1286.0	0.88	0.03	0.290	0.242	1.45
1291.0	0.87	0.02	0.290	0.242	1.43
1296.0	0.77	0.02	0.290	0.242	1.33
1301.0	0.76	0.02	0.290	0.242	1.31
1306.0	0.80	0.02	0.290	0.242	1.35
1311.0	0.75	0.03	0.290	0.242	1.31
1316.0	0.65	0.03	0.290	0.242	1.21
1321.0	0.67	0.00	0.293	0.243	1.20
1326.0	6.76	5.33	0.293	0.243	12.62
1331.0	0.71	0.05	0.293	0.243	1.30
1336.0	0.70	0.05	0.293	0.243	1.29
1341.0	0.50	0.04	0.293	0.243	1.08
1346.0	0.62	0.03	0.293	0.243	1.19
1351.0	0.57	0.02	0.293	0.243	1.12
1356.0	0.46	0.05	0.293	0.243	1.04
1361.0	0.43	0.03	0.293	0.243	1.00
1366.0	0.42	0.00	0.293	0.243	0.96
1371.0	0.38	0.00	0.293	0.243	0.92
1376.0	0.34	0.00	0.293	0.243	0.88
1381.0	0.32	0.00	0.289	0.244	0.85
1386.0	6.35	5.21	0.289	0.244	12.10
1391.0	0.33	0.01	0.289	0.244	0.88
1396.0	0.30	0.03	0.289	0.244	0.87
1401.0	0.21	0.03	0.289	0.244	0.77
1406.0	0.13	0.00	0.289	0.244	0.66
1411.0	0.22	0.00	0.289	0.244	0.75
1416.0	0.15	0.00	0.289	0.244	0.68
1421.0	0.18	0.00	0.289	0.244	0.72
1426.0	0.11	0.00	0.289	0.244	0.65
1431.0	0.13	0.00	0.289	0.244	0.67
1436.0	0.11	0.00	0.289	0.244	0.65
1440.0	0.10	0.00	0.289	0.244	0.63

FIGURES C-15 TO C-43

SAMPLE PROBLEM OUTPUT PLOTS

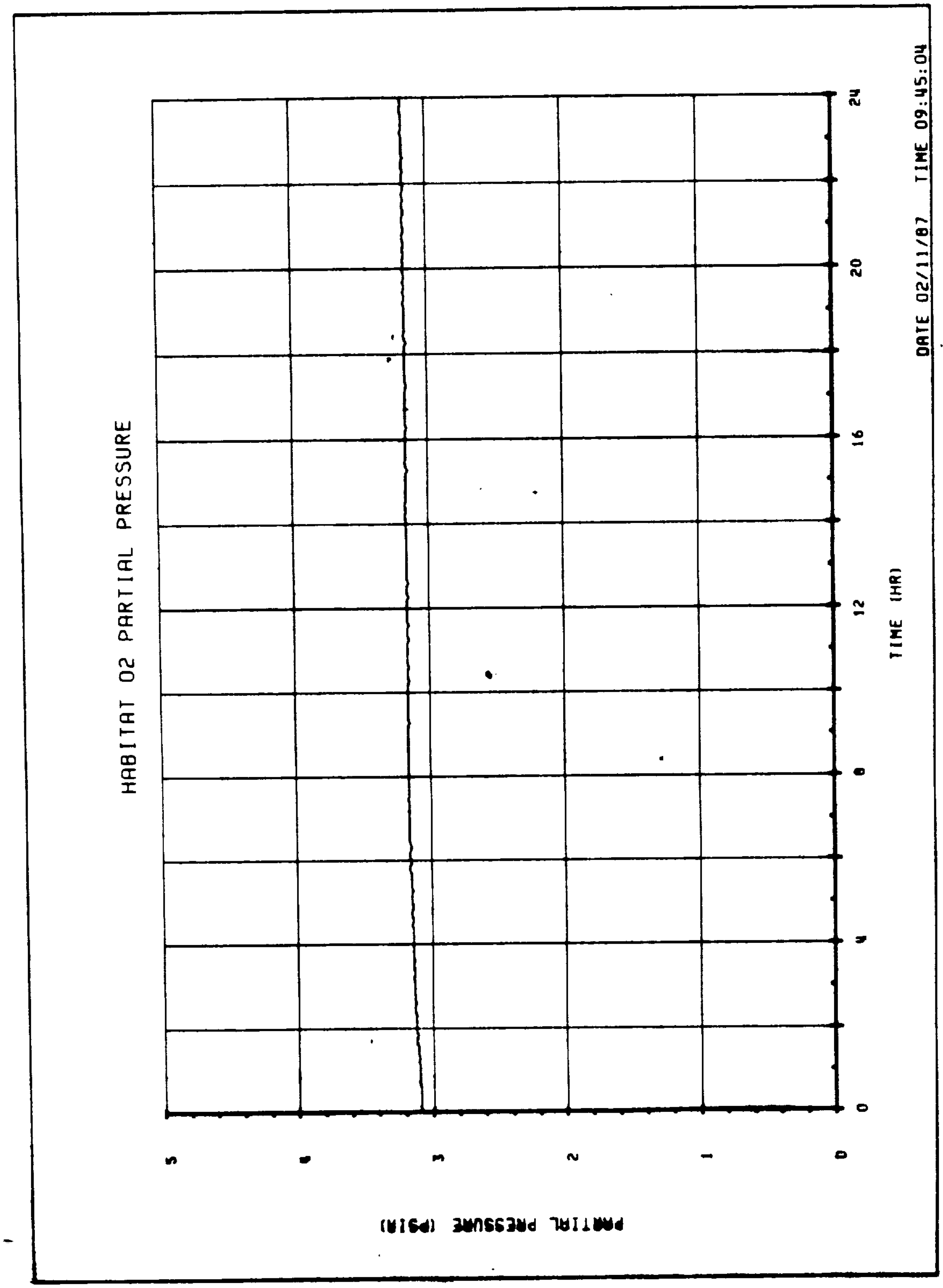

FIGURE C-15
HABITAT O2 PARTIAL PRESSURE

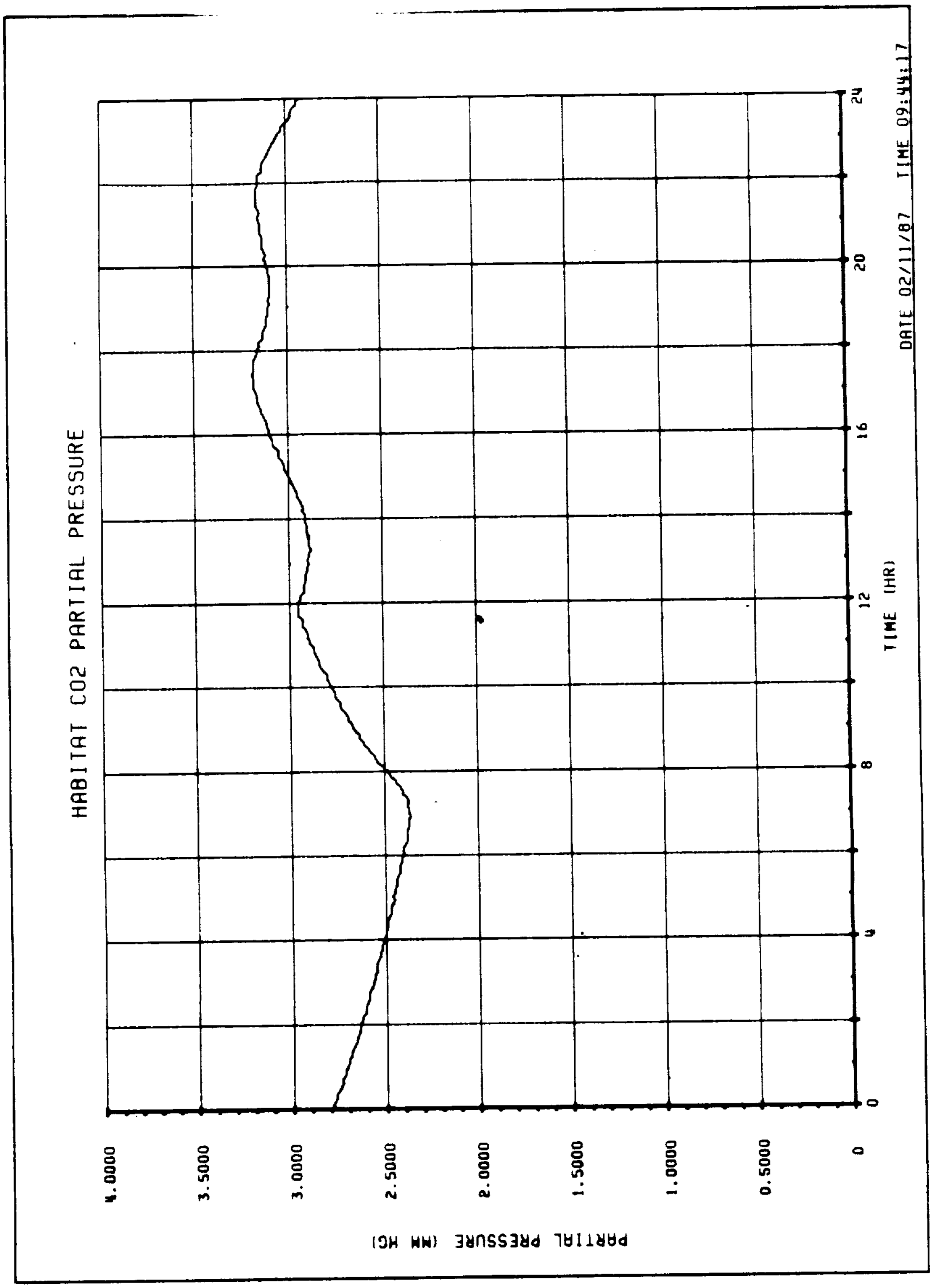

FIGURE C-16
HABITAT CO2 PARTIAL PRESSURE

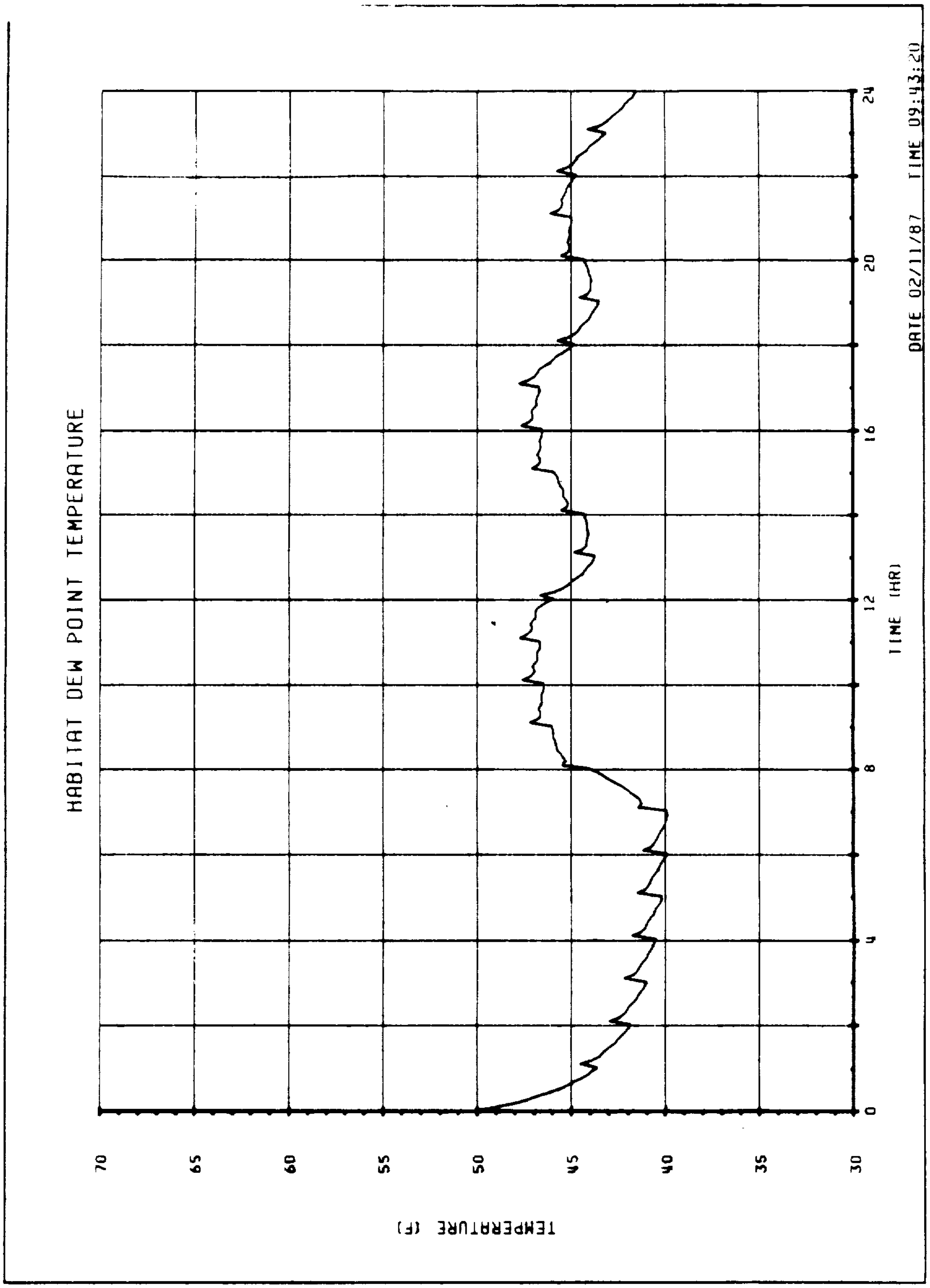

FIGURE C-17
HABITAT DEW POINT TEMPERATURE

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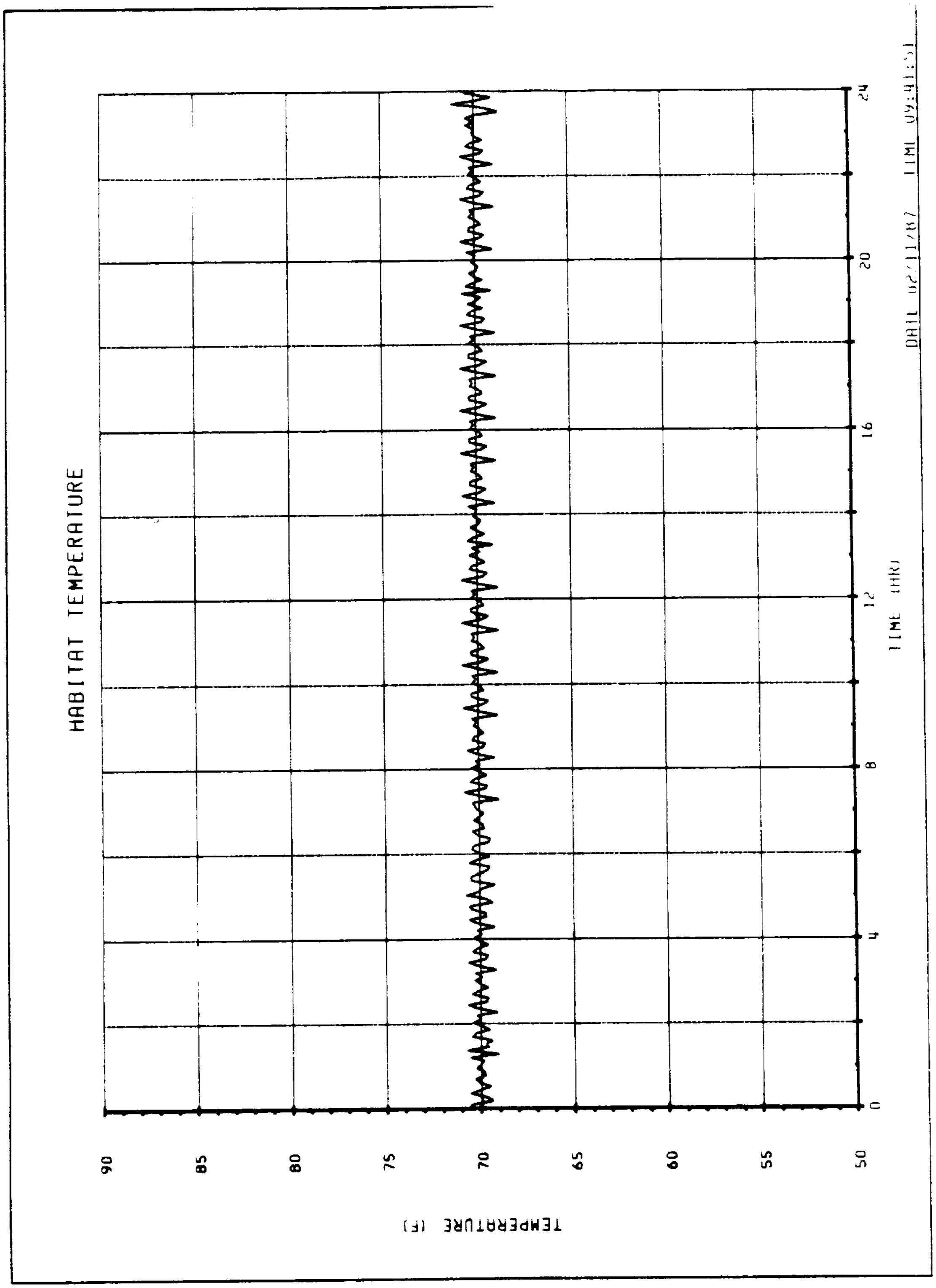

FIGURE C-18
HABITAT TEMPERATURE

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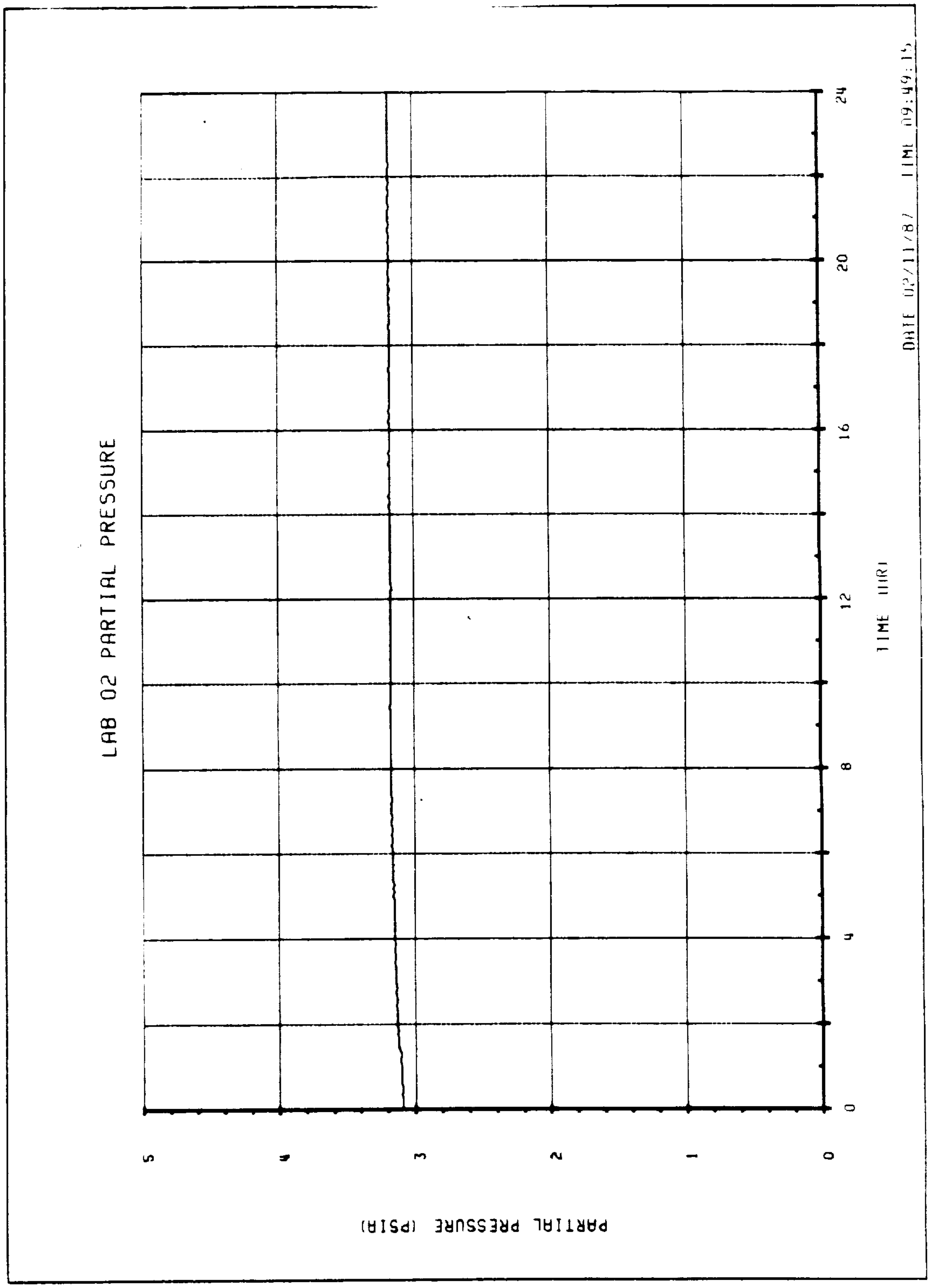

FIGURE C-19
LAB O2 PARTIAL PRESSURE

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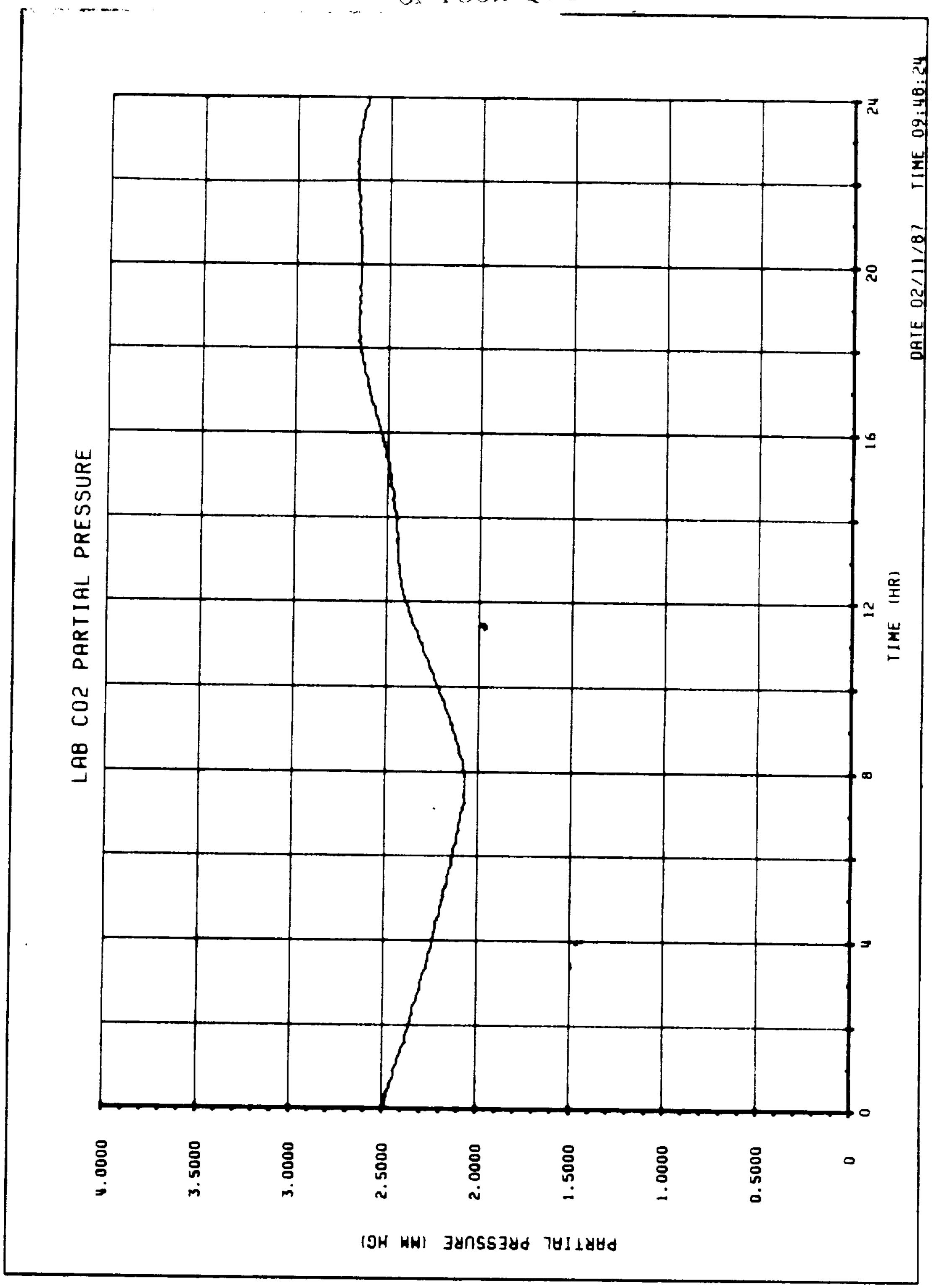

FIGURE C-20
LAB CO2 PARTIAL PRESSURE

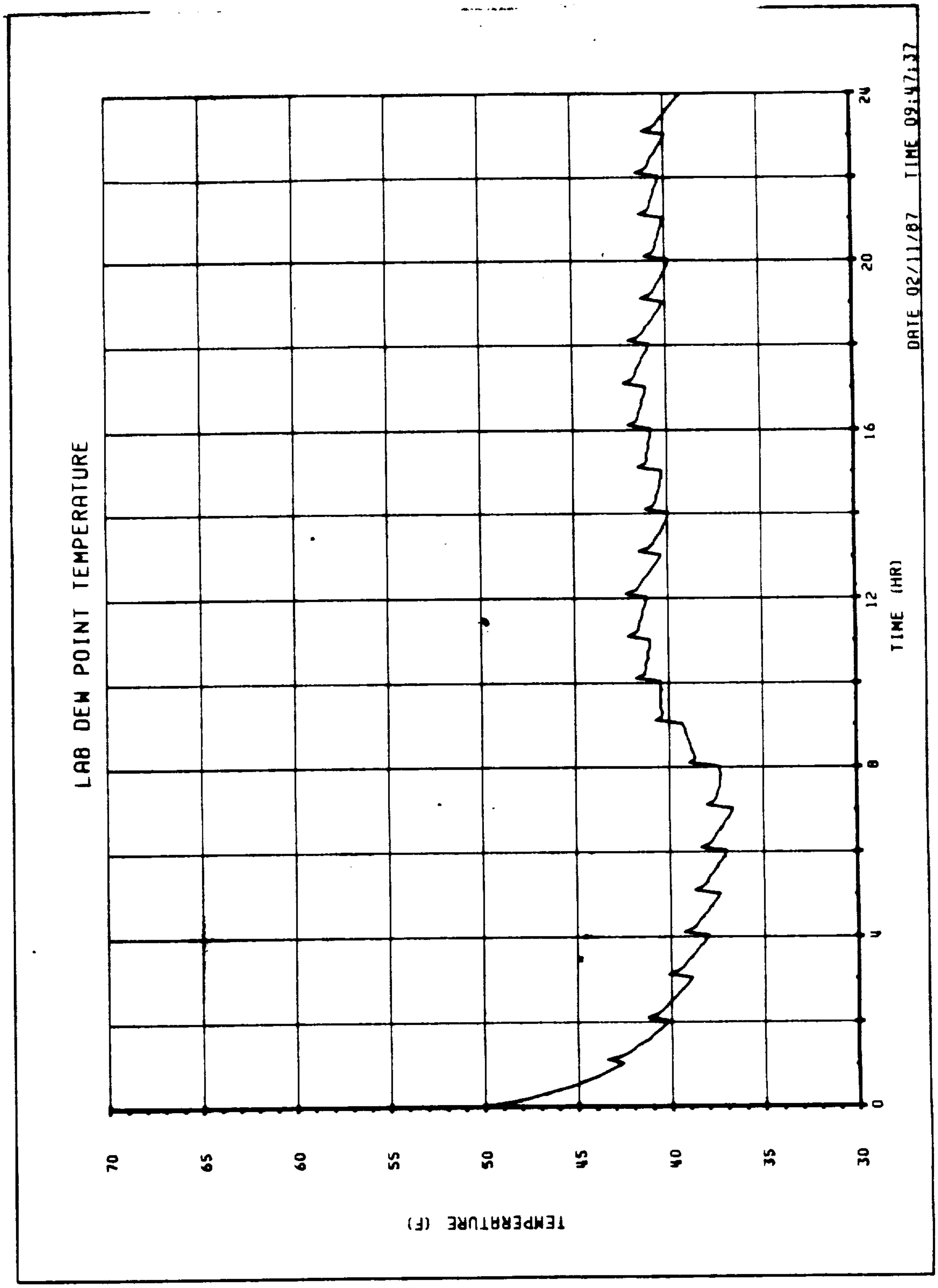

FIGURE C-21
LAB DEW POINT TEMPERATURE

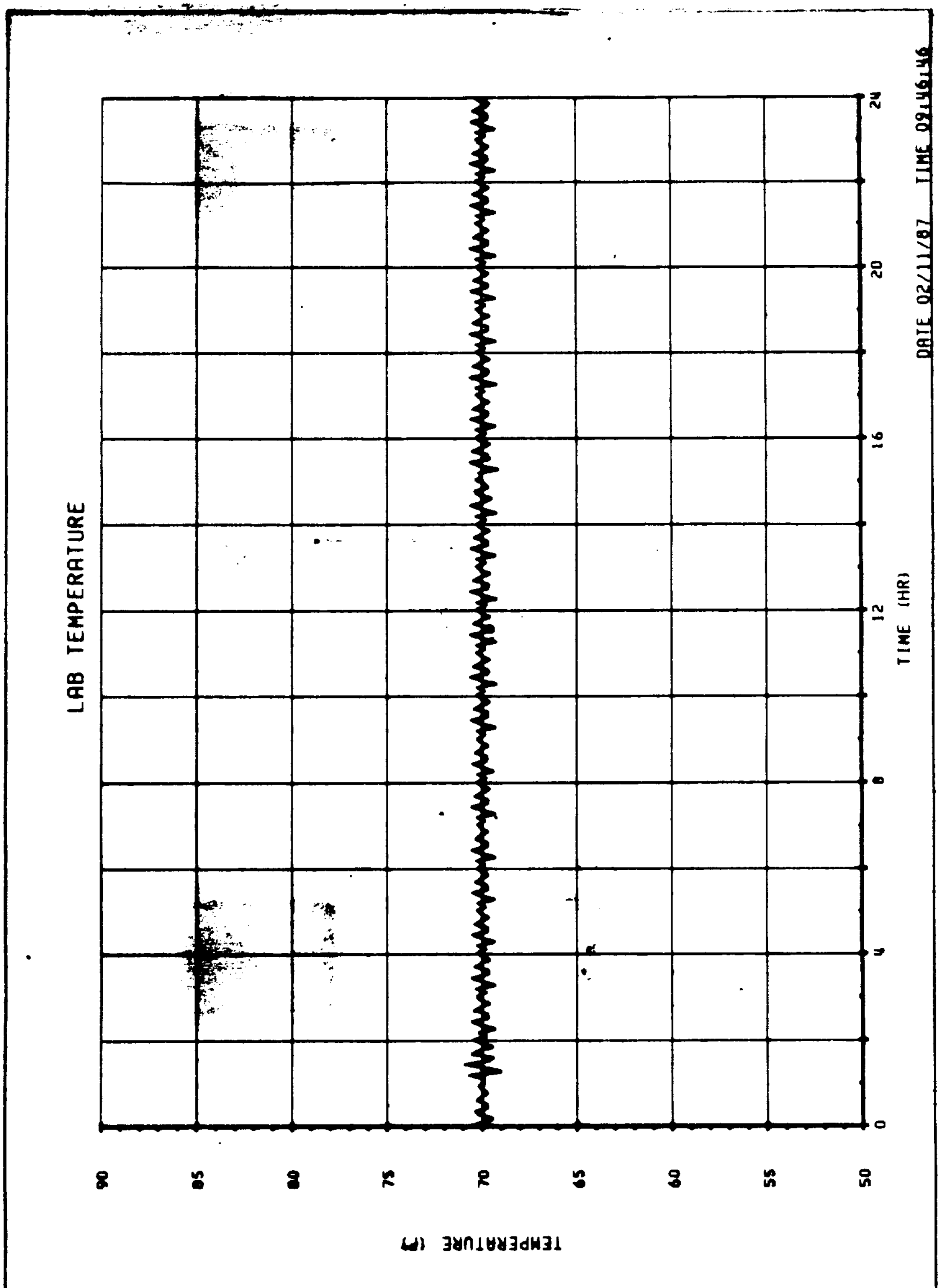

FIGURE C-22
LAB TEMPERATURE

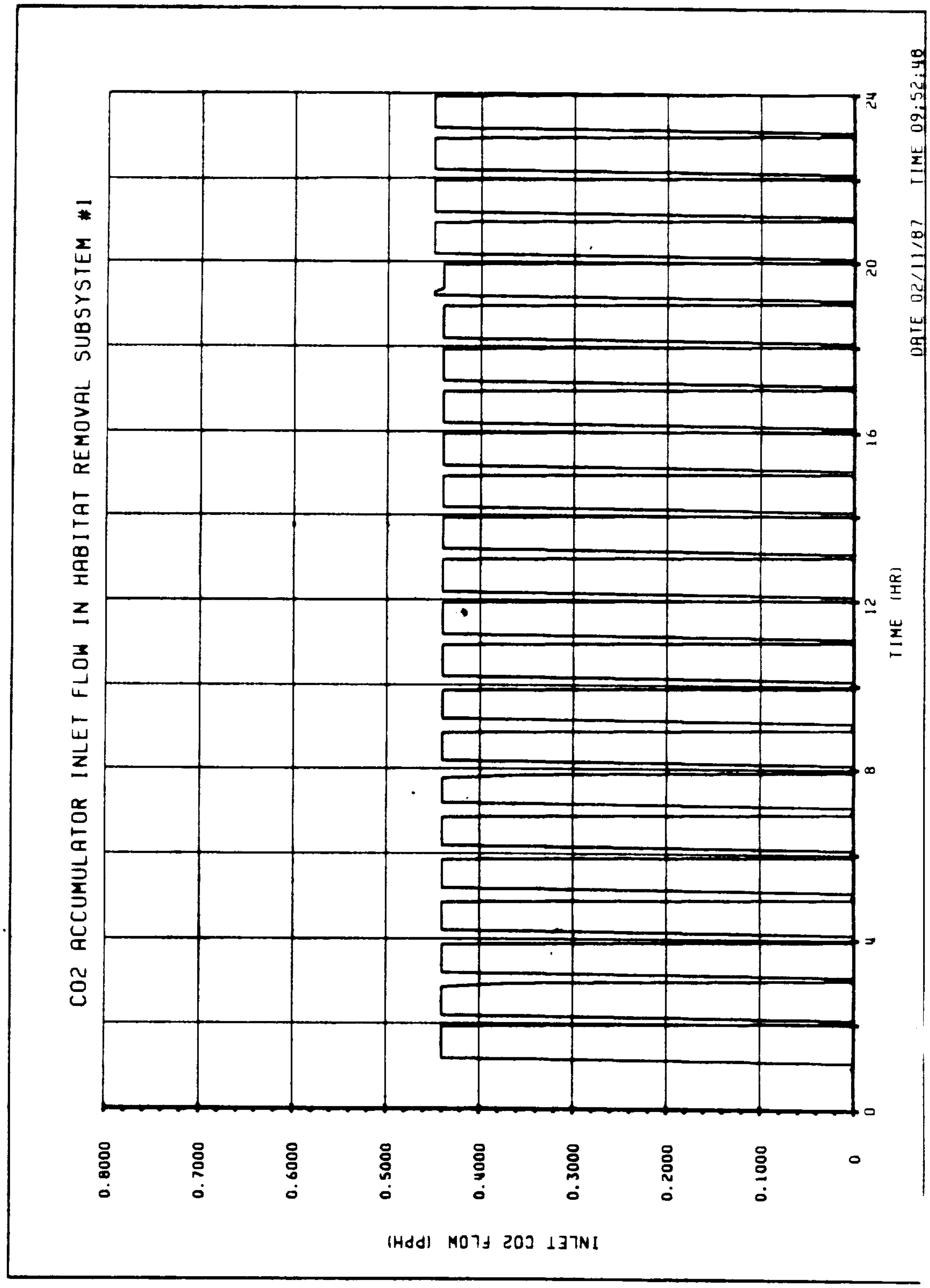

FIGURE C-23
CO2 ACCUMULATOR INLET FLOW IN HABITAT REMOVAL
SUBSYSTEM #1

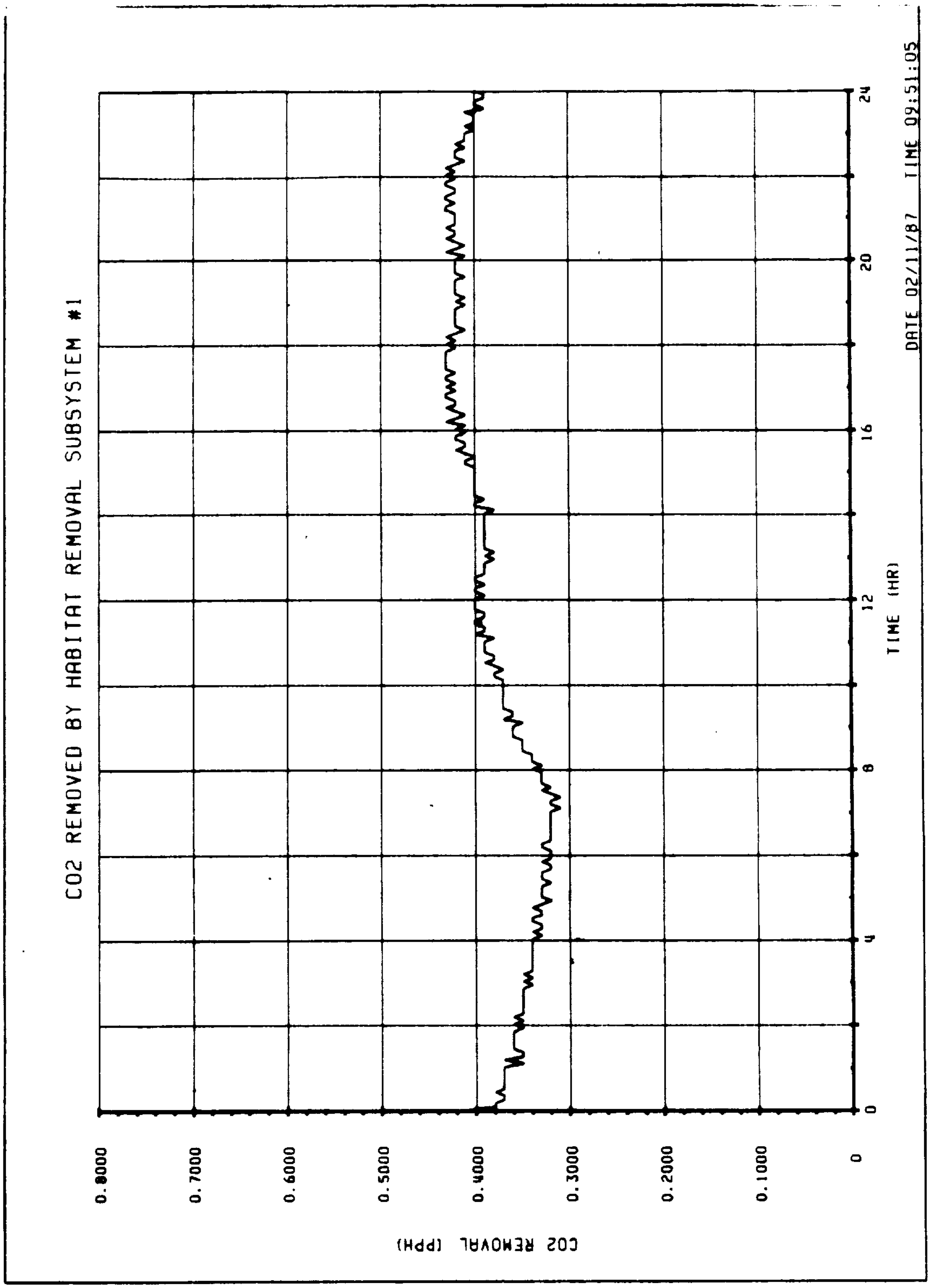

FIGURE C-24
CO2 REMOVED BYHABITAT REMOVAL SUBSYSTEM #1

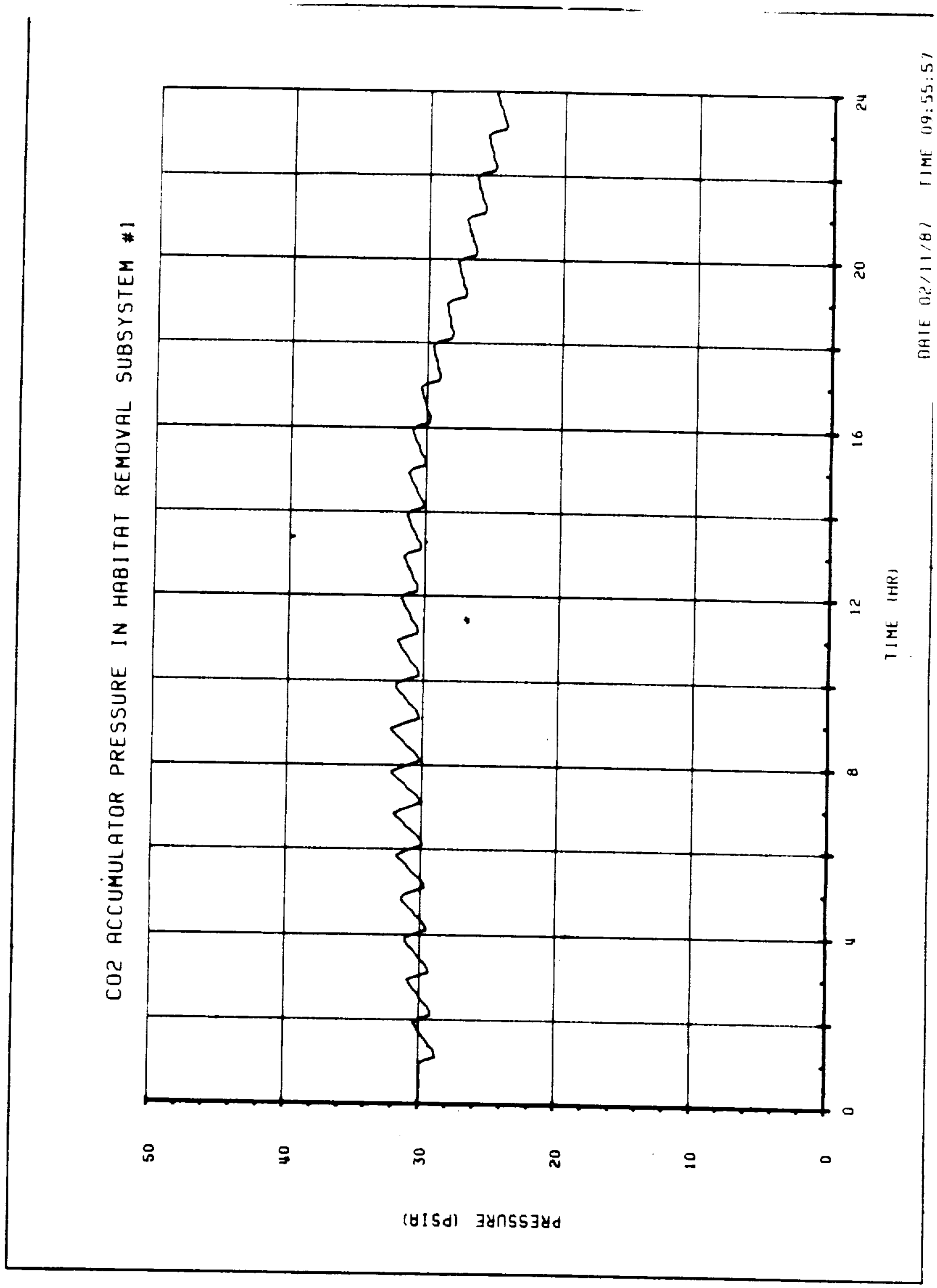

FIGURE C-25
CO2 ACCUMULATOR PRESSURE IN HABITAT REMOVAL
SUBSYSTEM #1

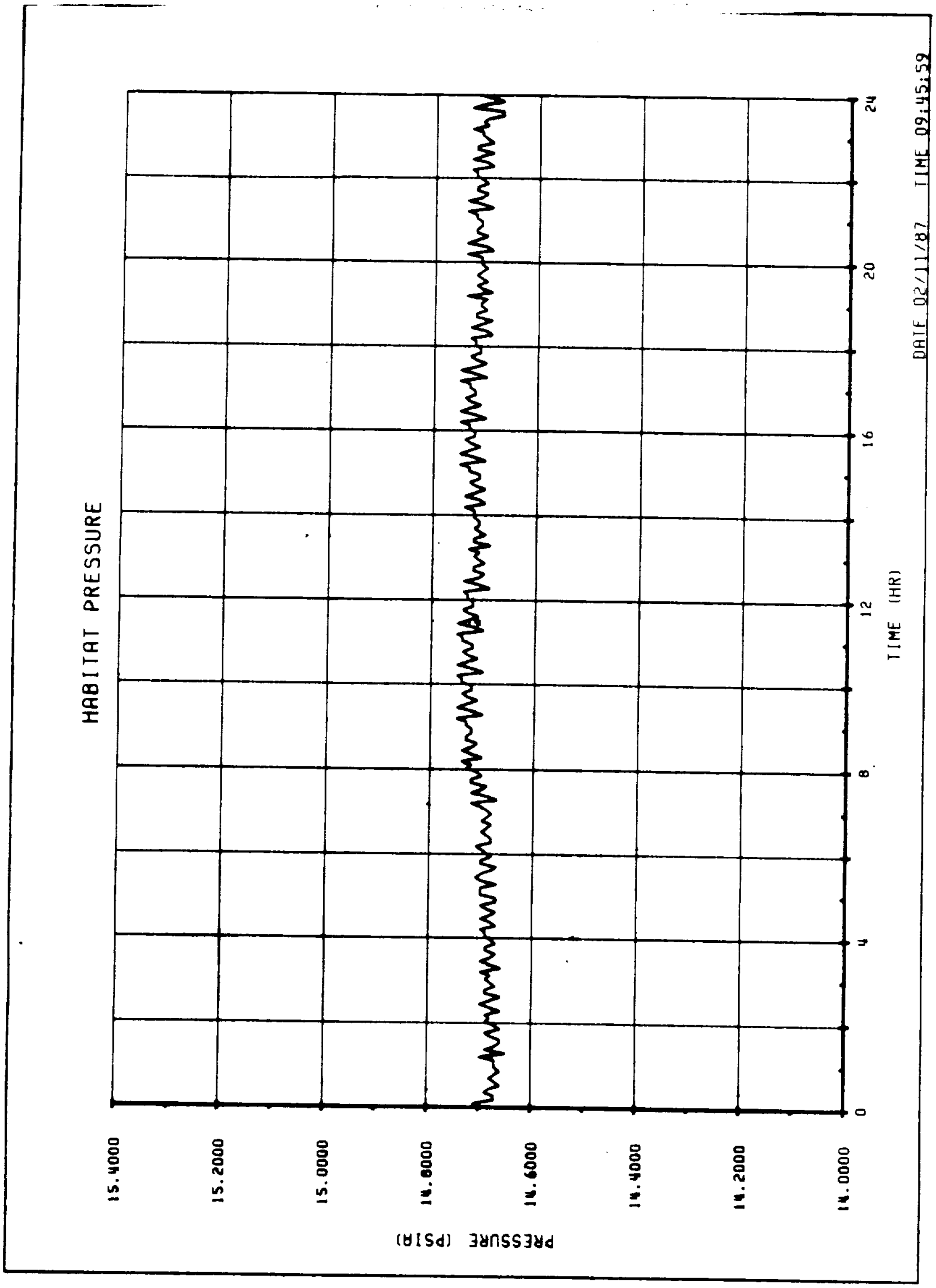

FIGURE C-26
HABITAT PRESSURE

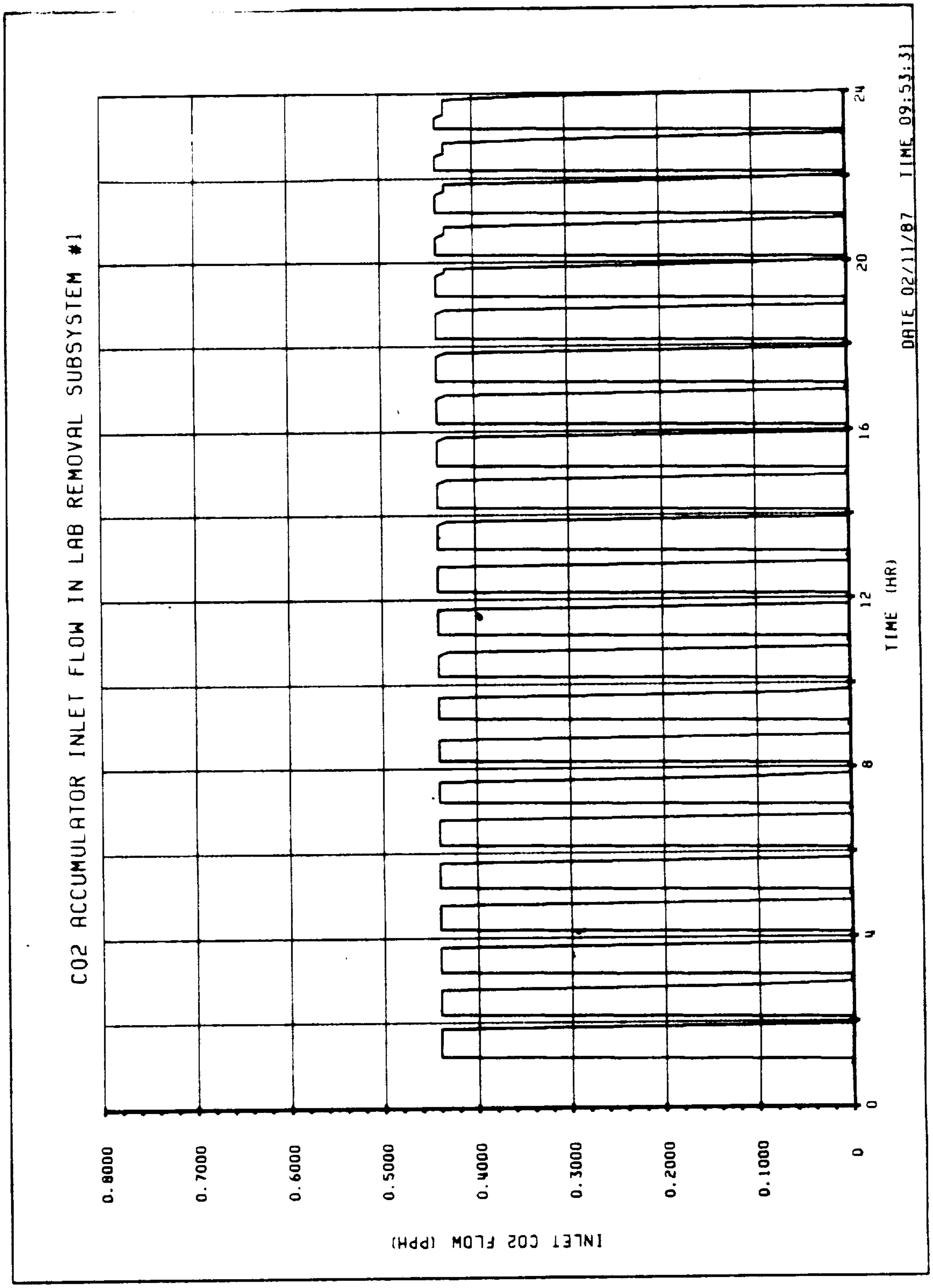

FIGURE C-27
CO2 ACCUMULATOR INLET FLOW IN LAB REMOVAL SUBSYSTEM #1

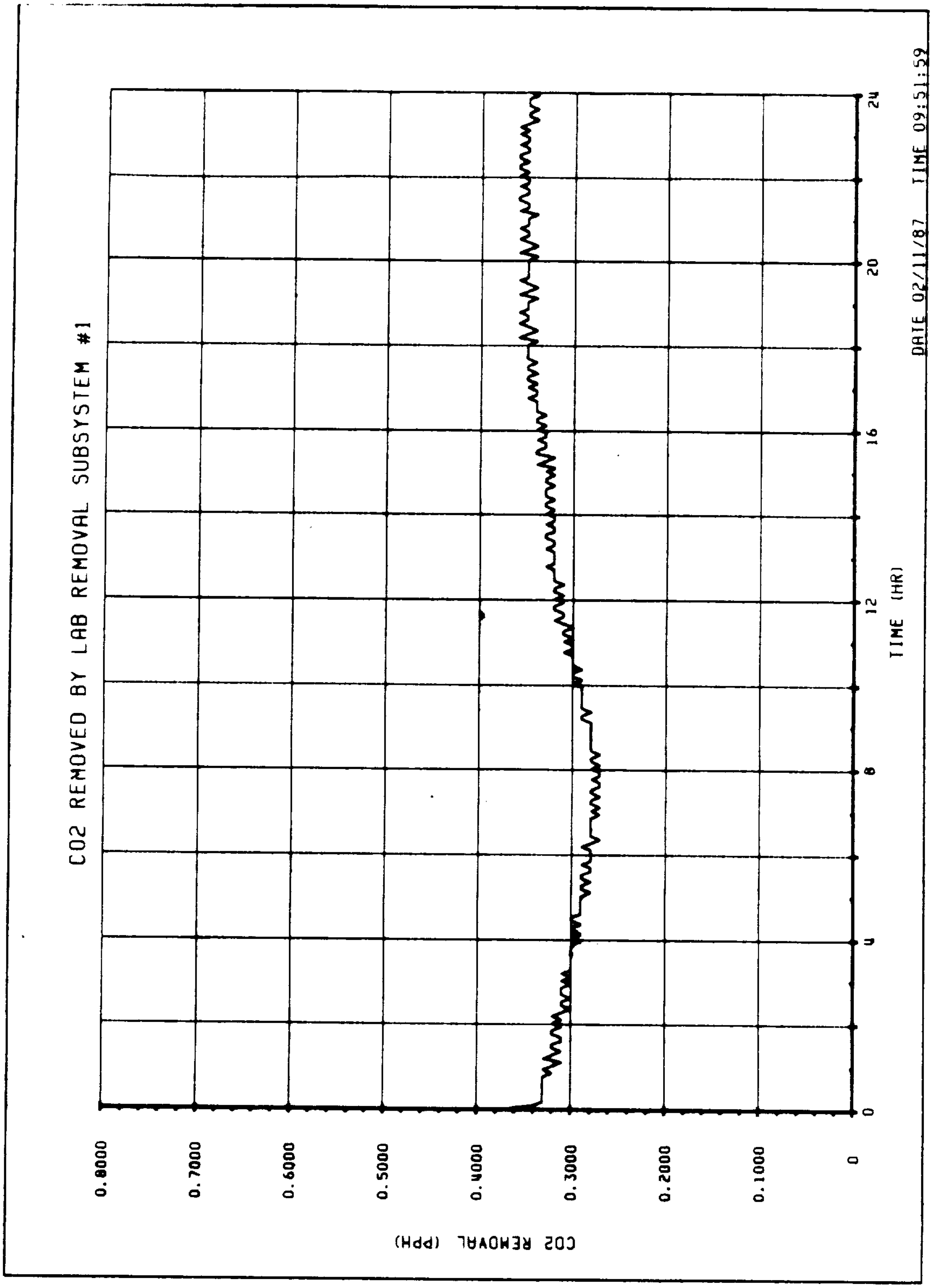

FIGURE C-28
CO2 REMOVED BY LAB REMOVED SUBSYSTEM #1

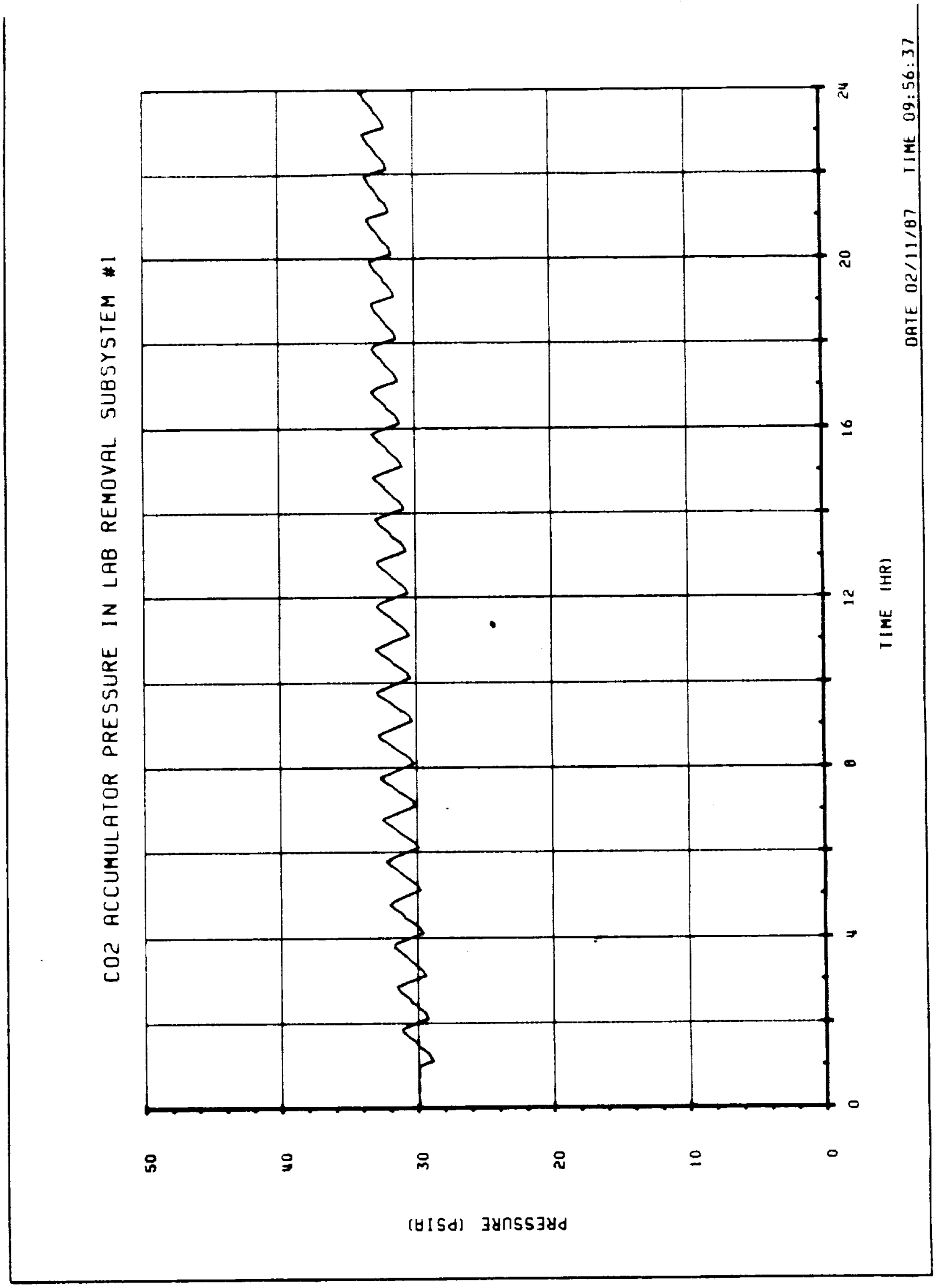

FIGURE C-29
CO2 ACCUMULATOR PRESSURE IN LAB REMOVAL SUBSYSTEM #1

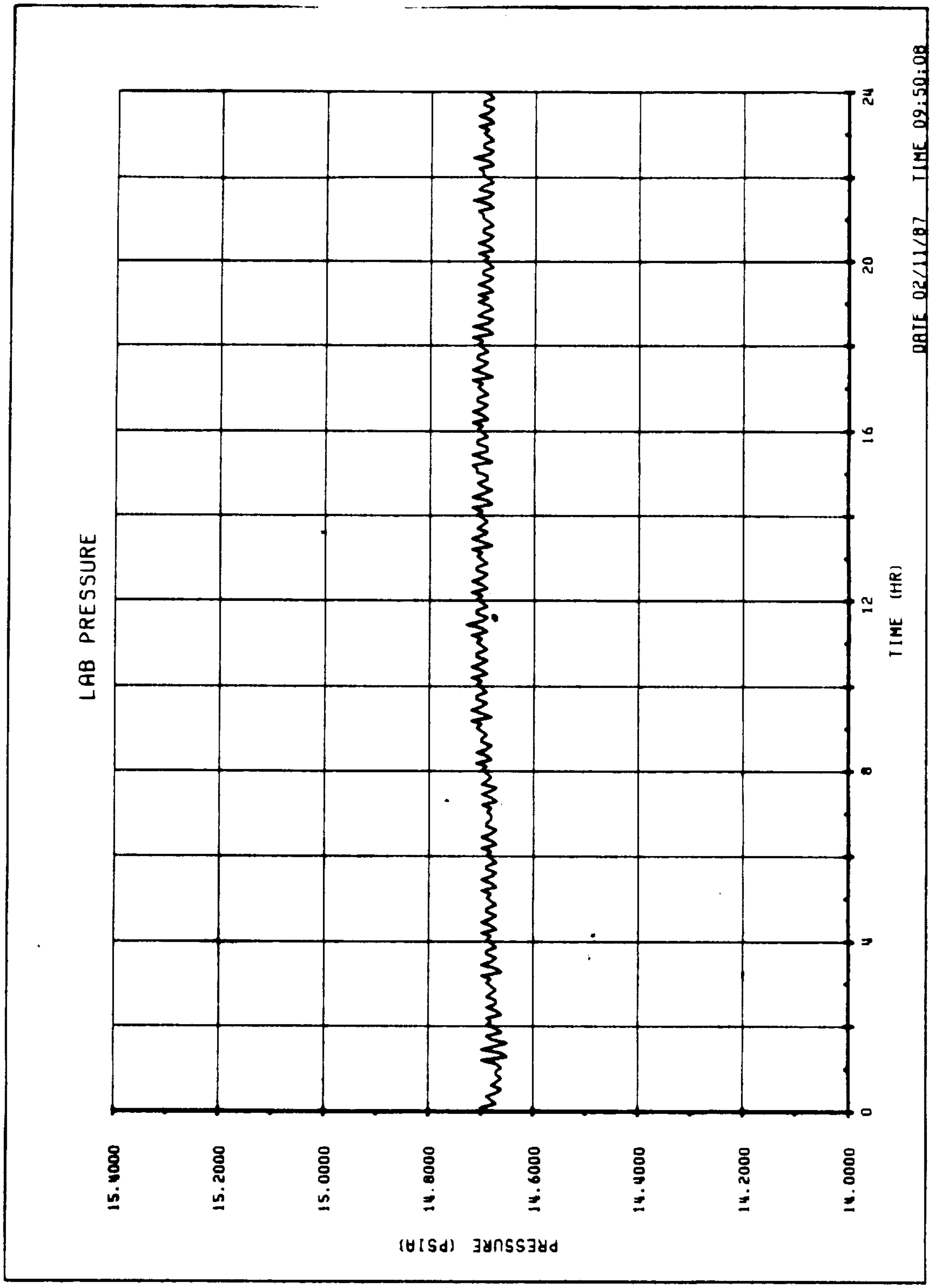

FIGURE C-30
LAB PRESSURE

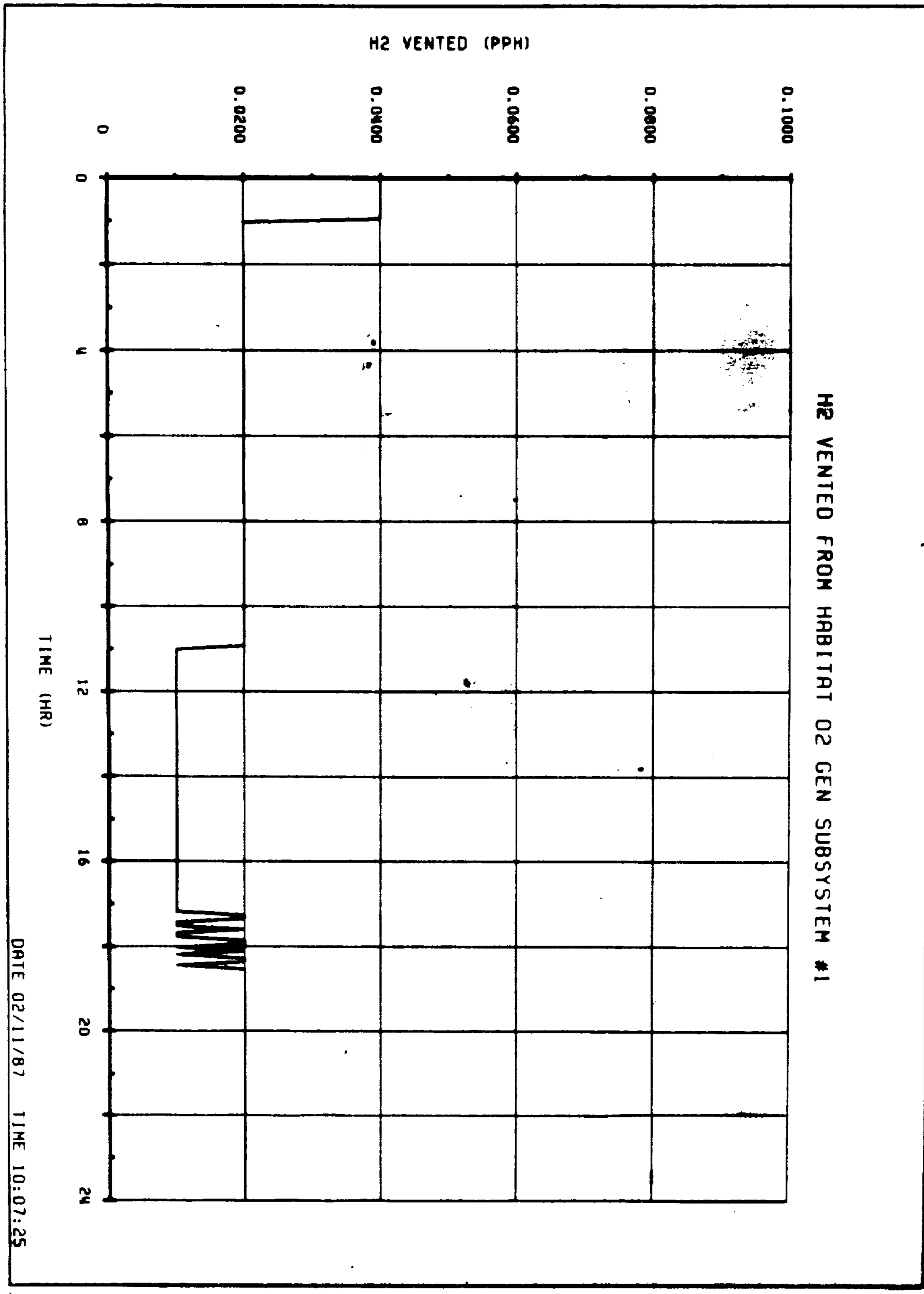

FIGURE C-31
H2 VENTED FROM HABITAT O2 GEN SUBSYSTEM #1

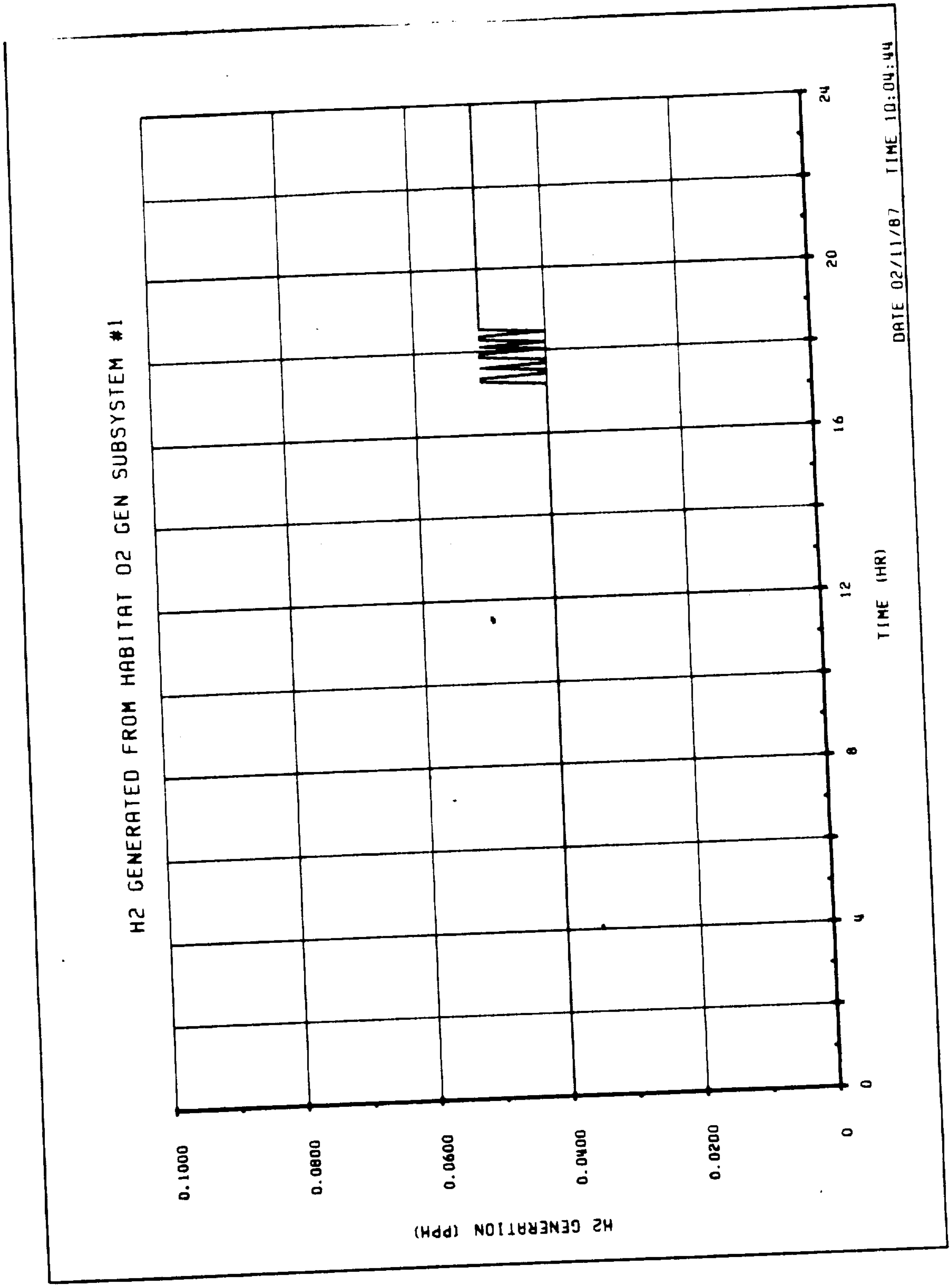

FIGURE C-32
H2 GENERATED FROM HABITAT O2 GEN SUBSYSTEM #1

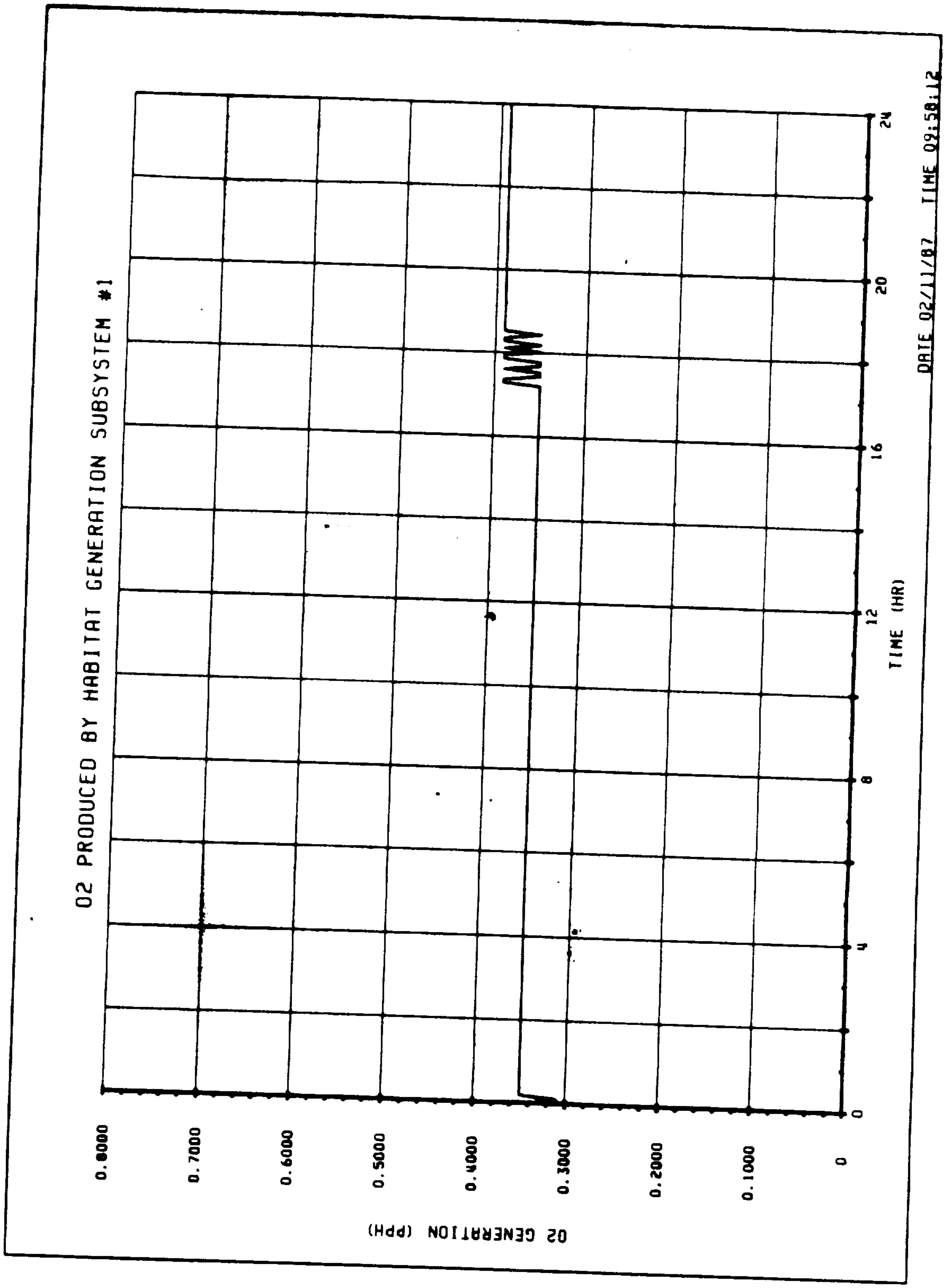

FIGURE C-33
O2 PRODUCED BY HABITAT O2 GEN SUBSYSTEM #1

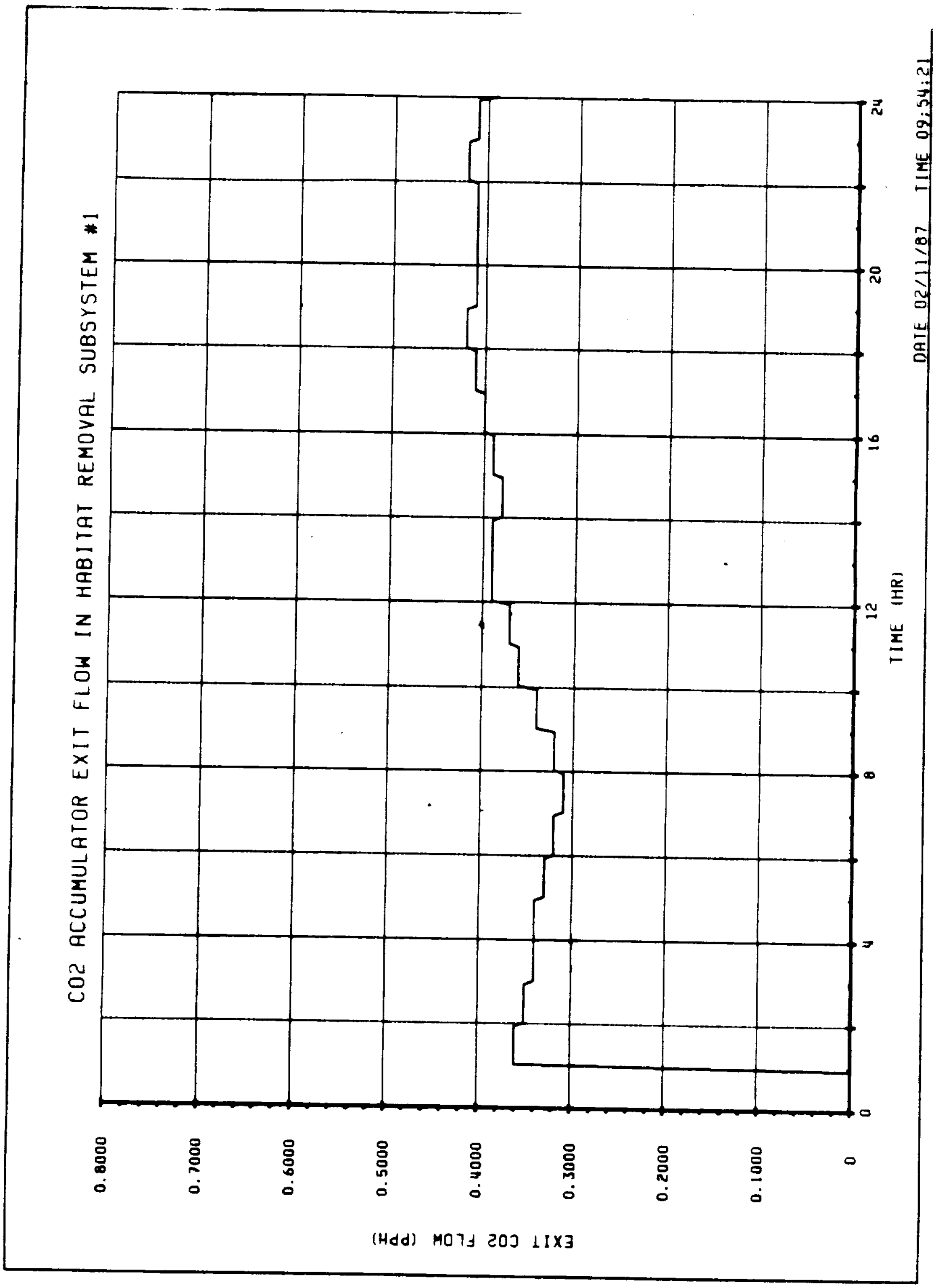

FIGURE C-34
CO2 ACCUMULATOR EXIT FLOW IN HABITAT REMOVAL SUBSYSTEM #1

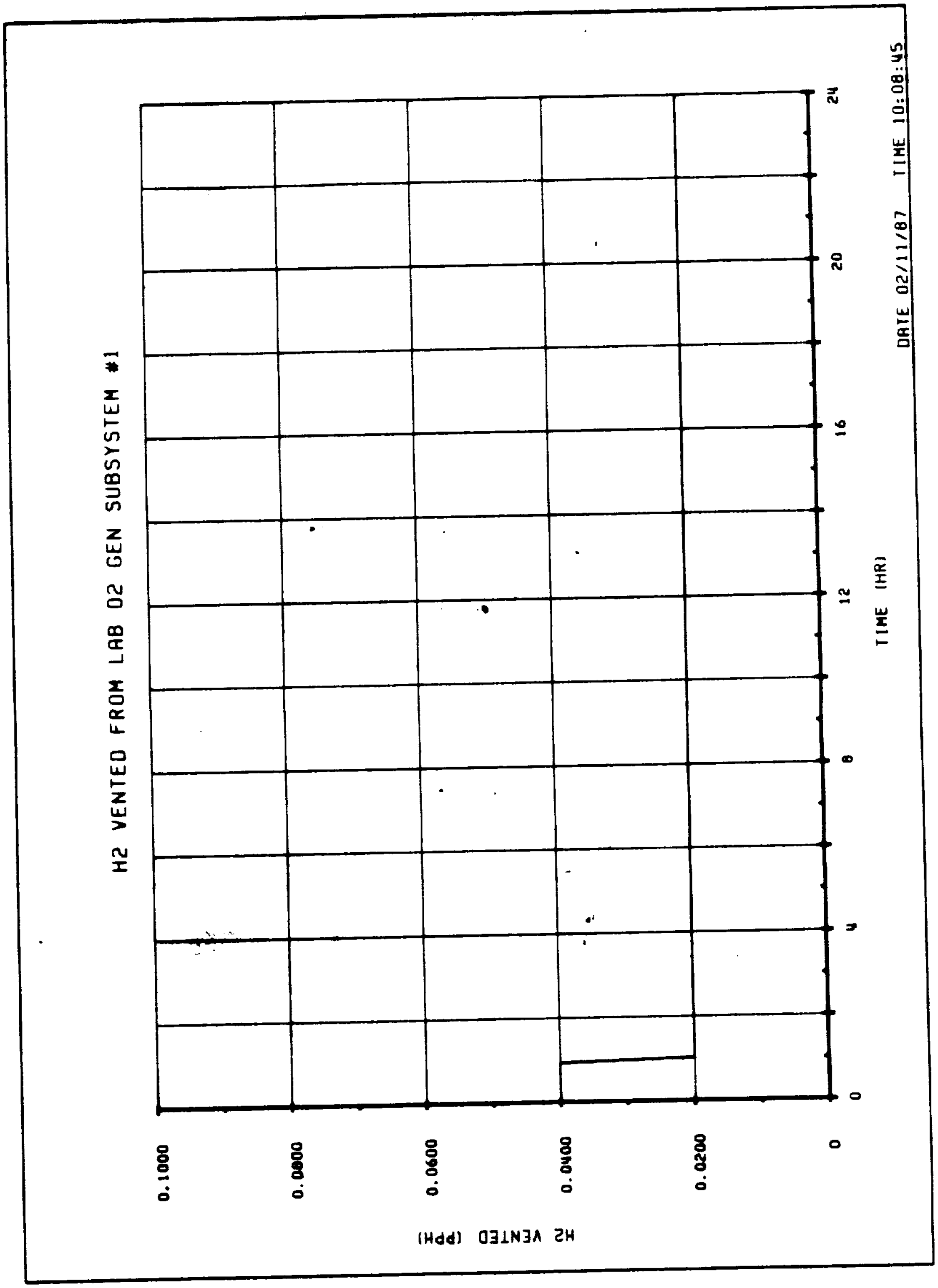

FIGURE C-35
H2 VENTED FROMLAB O2 GEN SUBSYSTEM #1

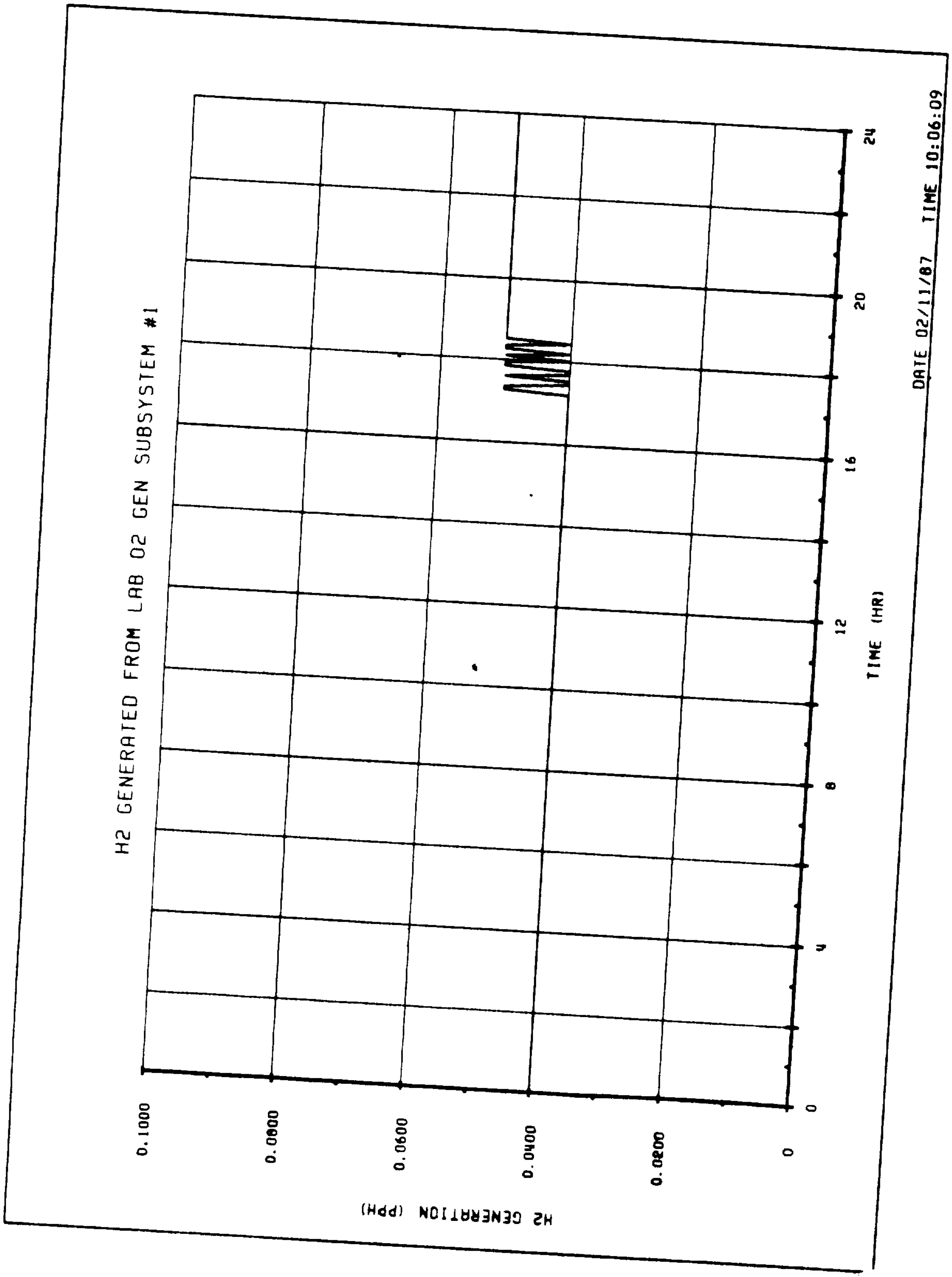

FIGURE C-36
H2 GENERATED FROM LAB O2 GEN SUBSYSTEM #1

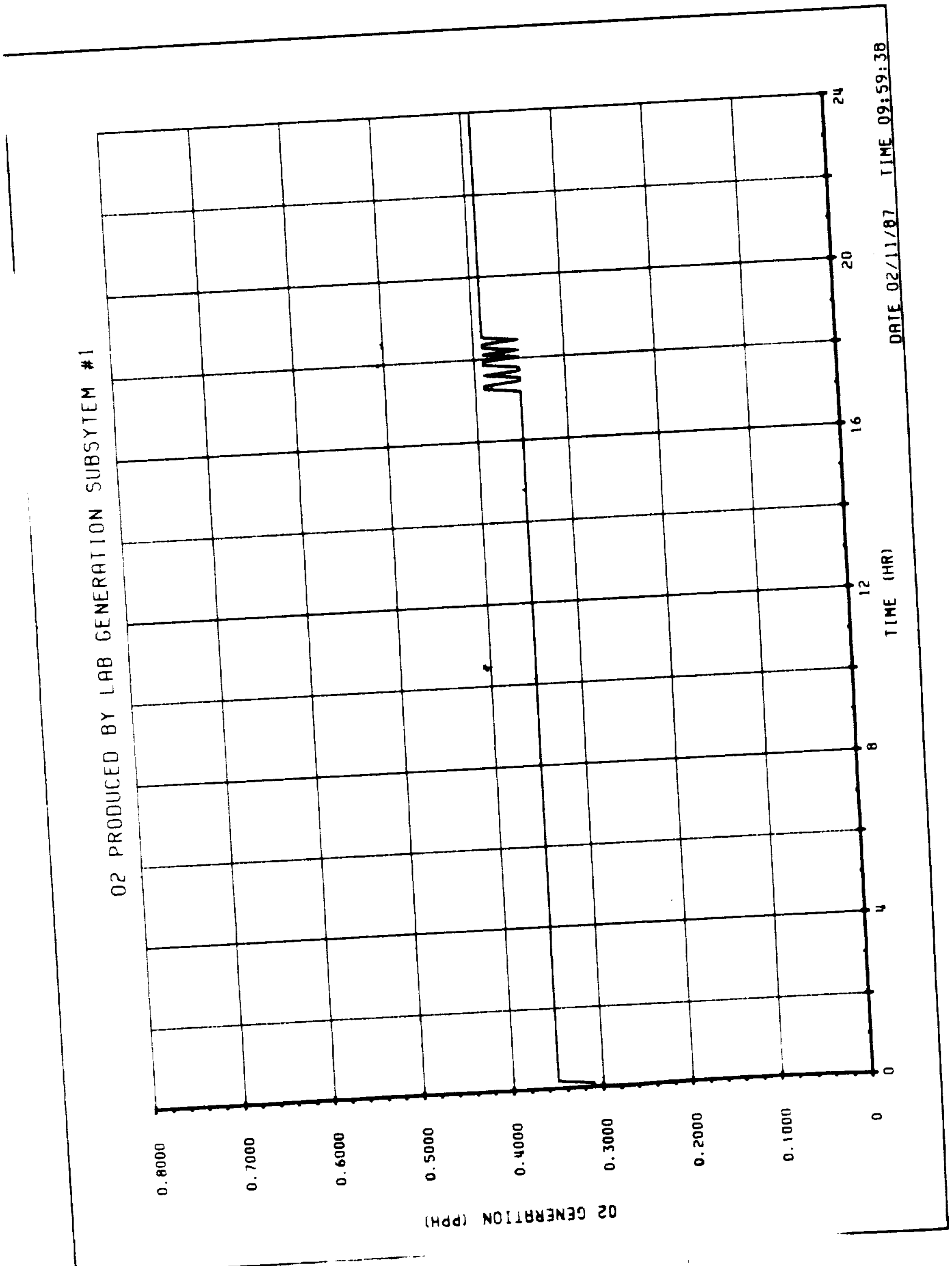

FIGURE C-37
O2 PRODUCED BYLAB O2 GEN SUBSYSTEM #1

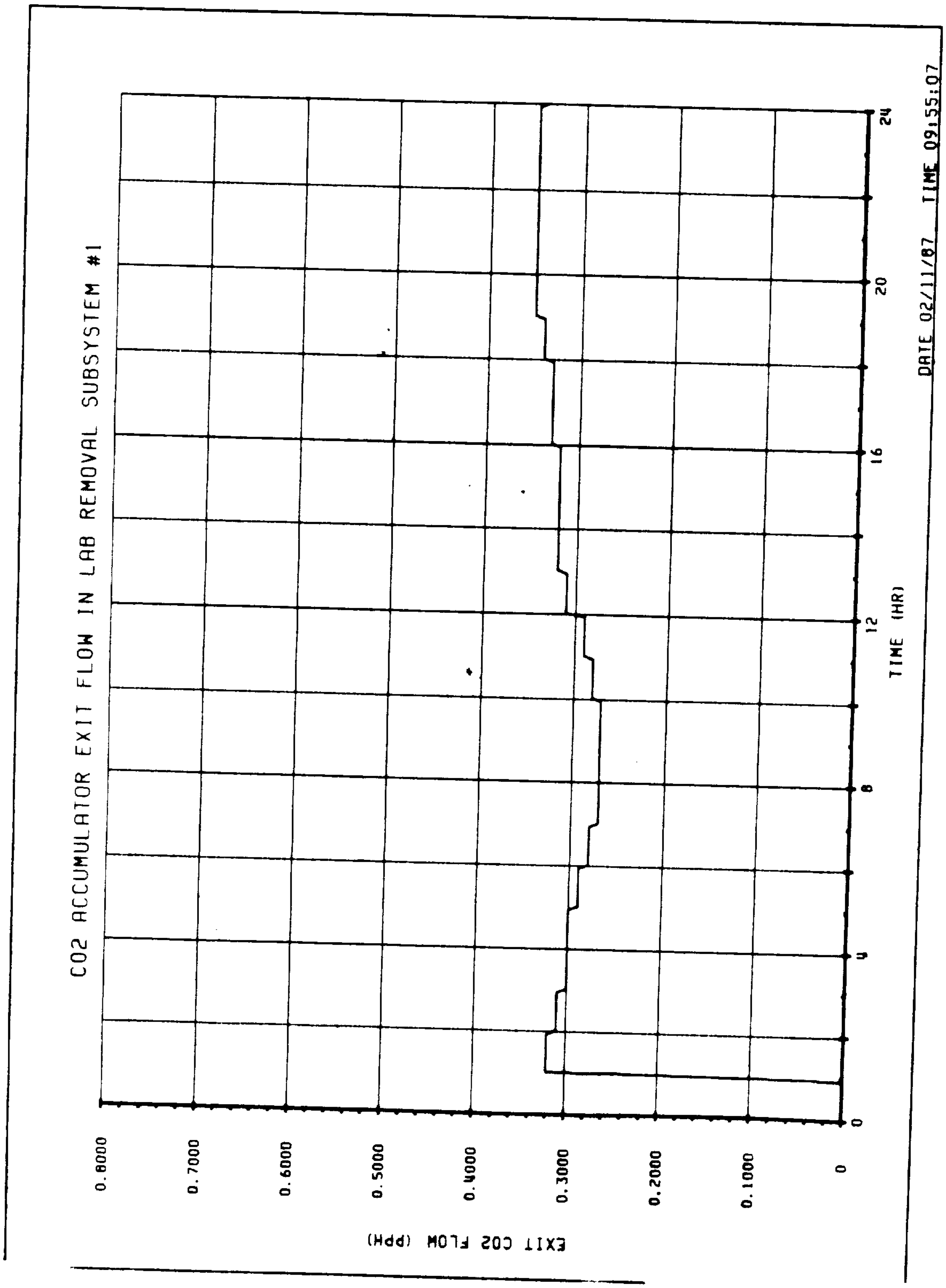

FIGURE C-38
CO2 ACCUMULATOR EXIT FLOW IN LAB REMOVAL SUBSYSTEM #1

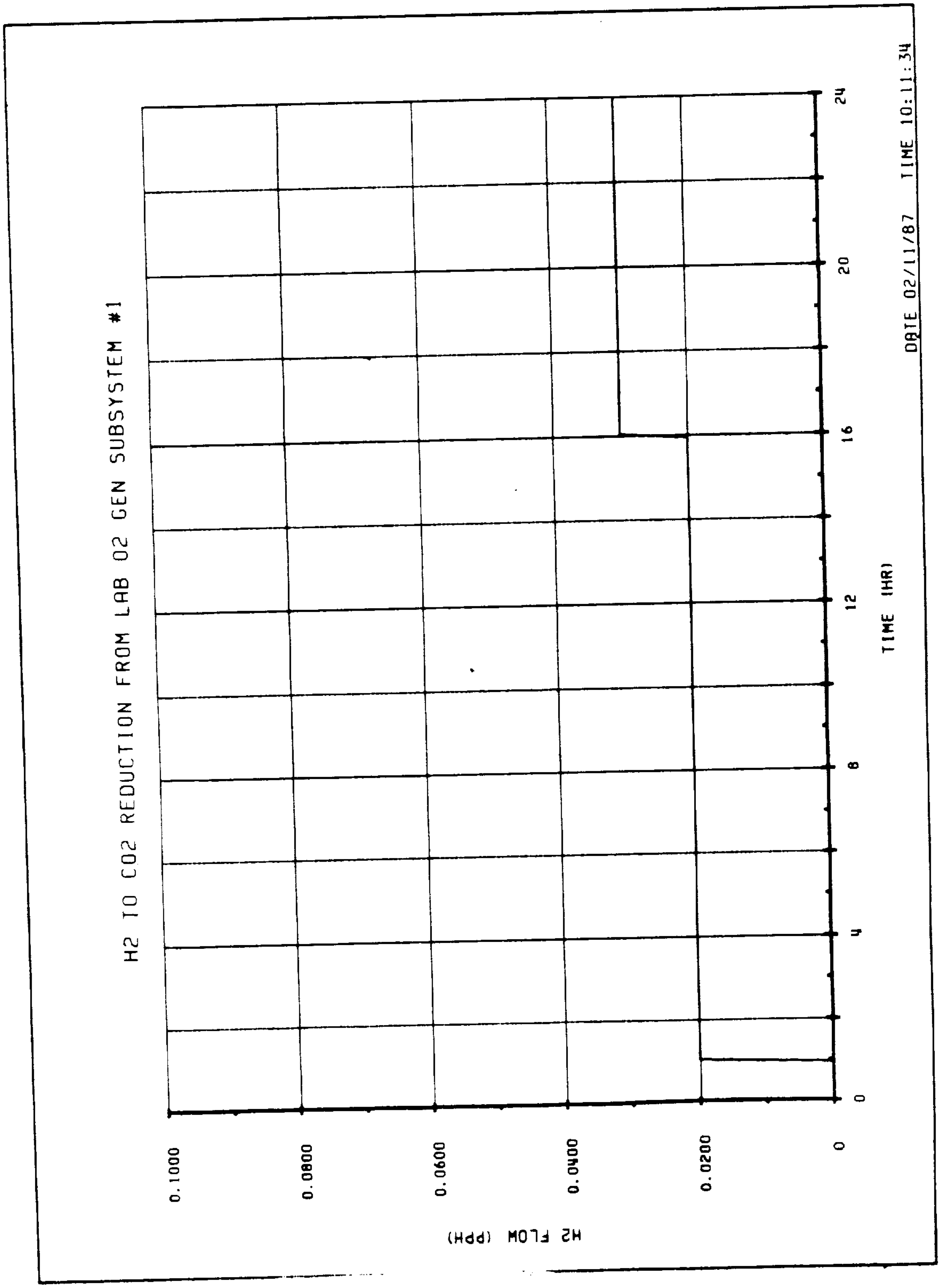

FIGURE C-39
H2 TO CO2 REDUCTION FROM LAB O2 GEN SUBSYSTEM #1

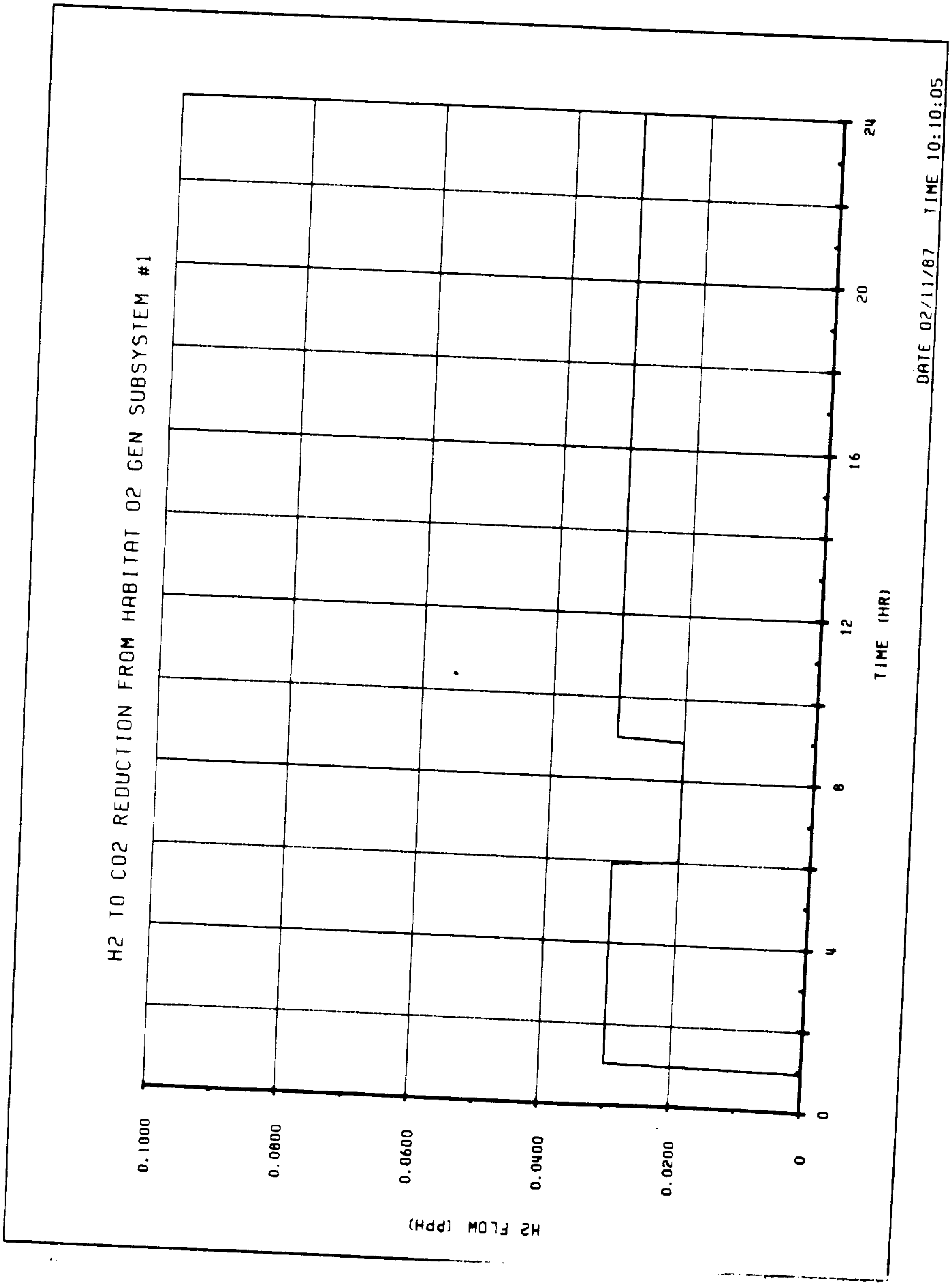

FIGURE C-40
H2 TO CO2 REDUCTION FROM HABITAT O2 GEN SUBSYSTEM #1

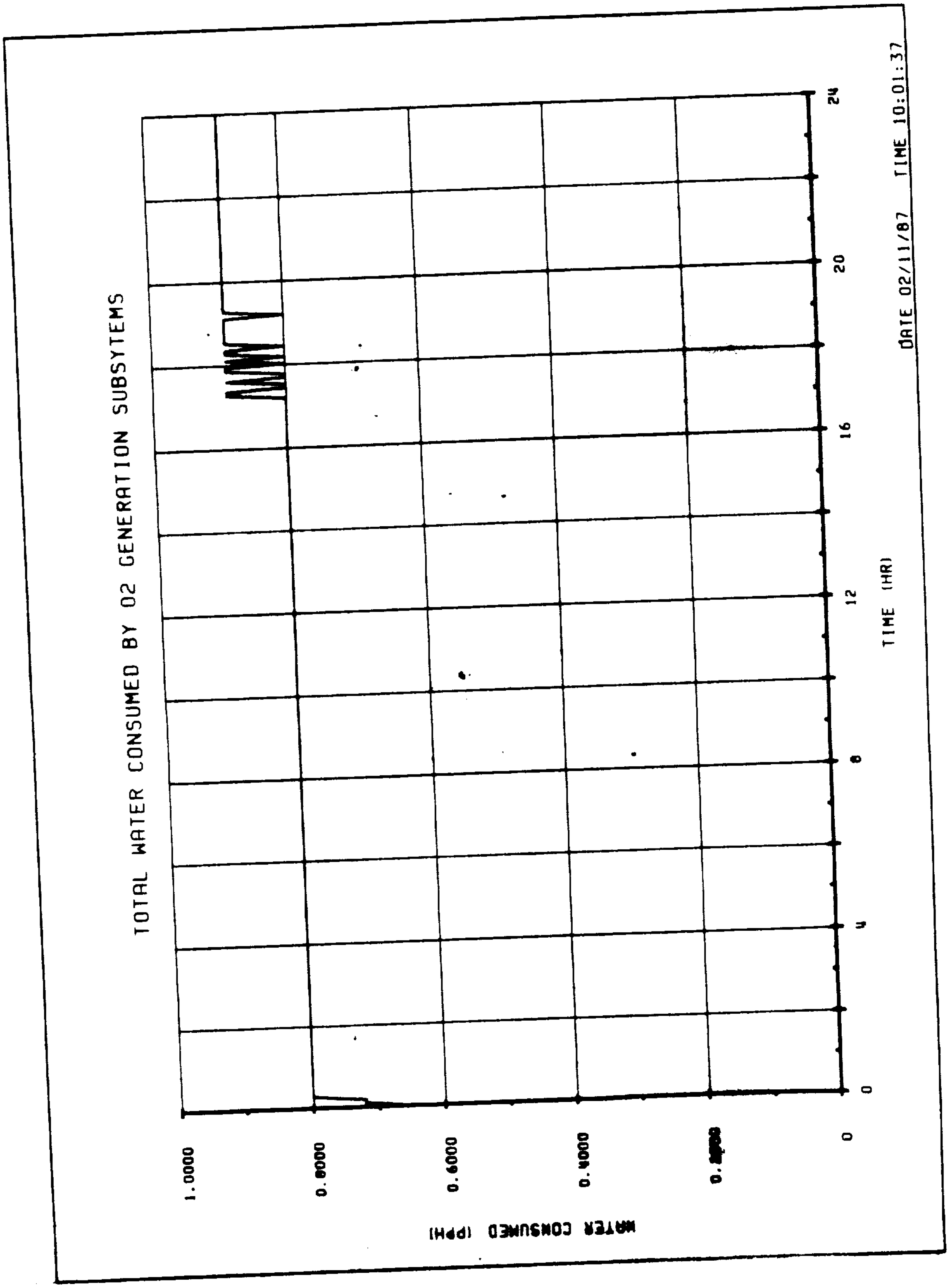

FIGURE C-41
TOTAL WATER CONSUMED BY O2 GENERATION SUBSYSTEMS

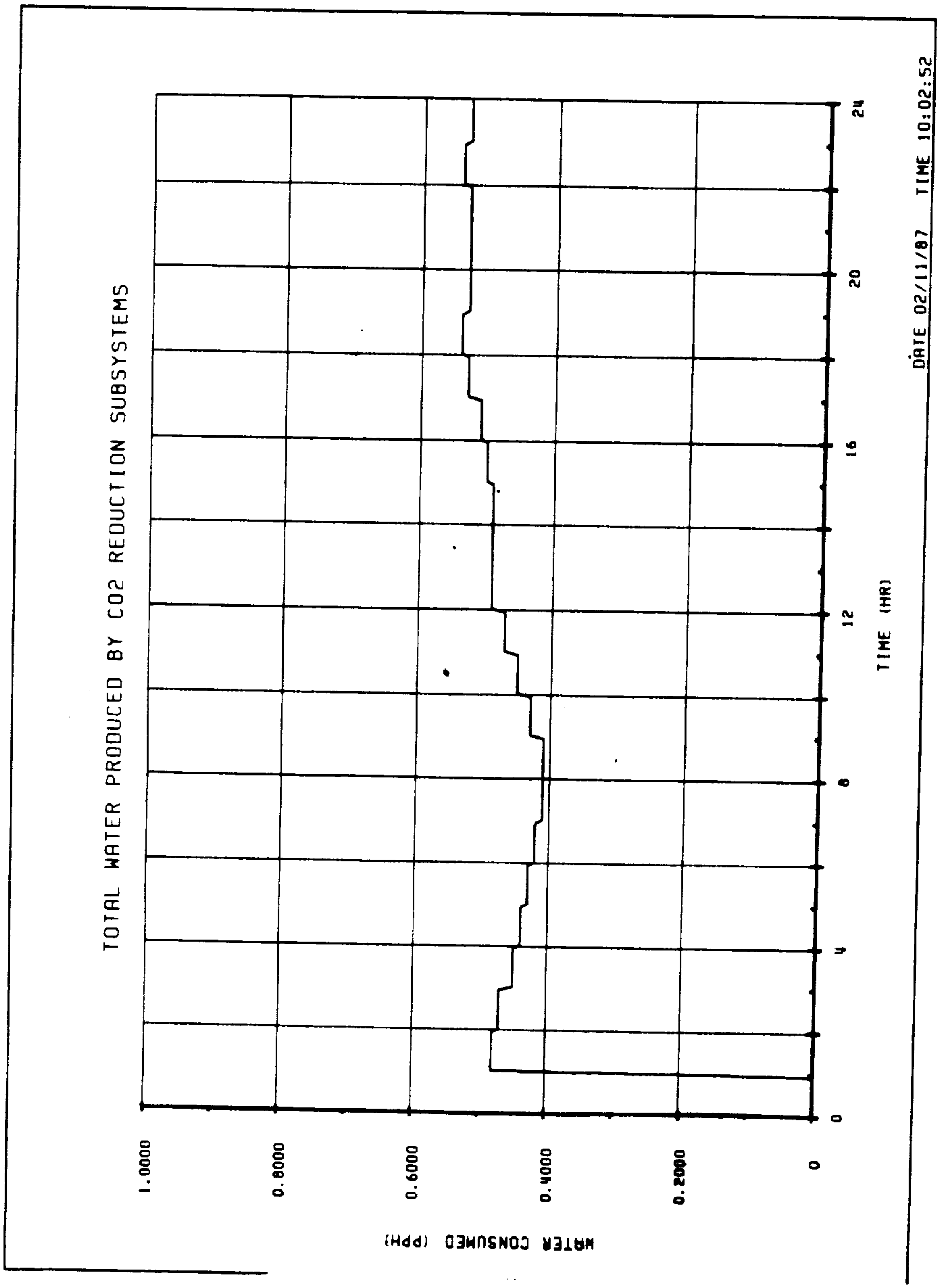

FIGURE C-42
TOTAL WATER PRODUCED BY CO2 REDUCTION SUBSYSTEMS

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Report Documentation Page

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15. Supplementary Notes

Langley Technical Monitors: John B. Hall, Jr., and Lawrence F. Rowell

16. Abstract A User's Manual for the Emulation Simulation Computer Model was published previously. The model consisted of a detailed model (emulation) of a SAWD CO_2 removal subsystem which operated with much less detailed (simulation) models of a cabin, crew, and condensing and sensible heat exchangers. The purpose was to explore the utility of such an emulation/simulation combination in the design, development, and test of a piece of ARS hardware - SAWD.

Extensions to this original effort are presented in the manual. The first extension is an update of the model to reflect changes in the SAWD control logic which resulted from test. In addition, slight changes were also made to the SAWD model to permit restarting and to improve the iteration technique. The second extension is the development of simulation models for more pieces of air and water processing equipment. Models are presented for: EDC, Molecular Sieve, Bosch, Sabatier, a new condensing heat exchanger, SPE, SFWES, Catalytic Oxidizer, and multifiltration. The third extension is to create two system simulations using these models. The first system presented consists of one air and one water processing system. The second system consists of a potential Space Station air revitalization system complete with a habitat, laboratory, four modes, and two crews.

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